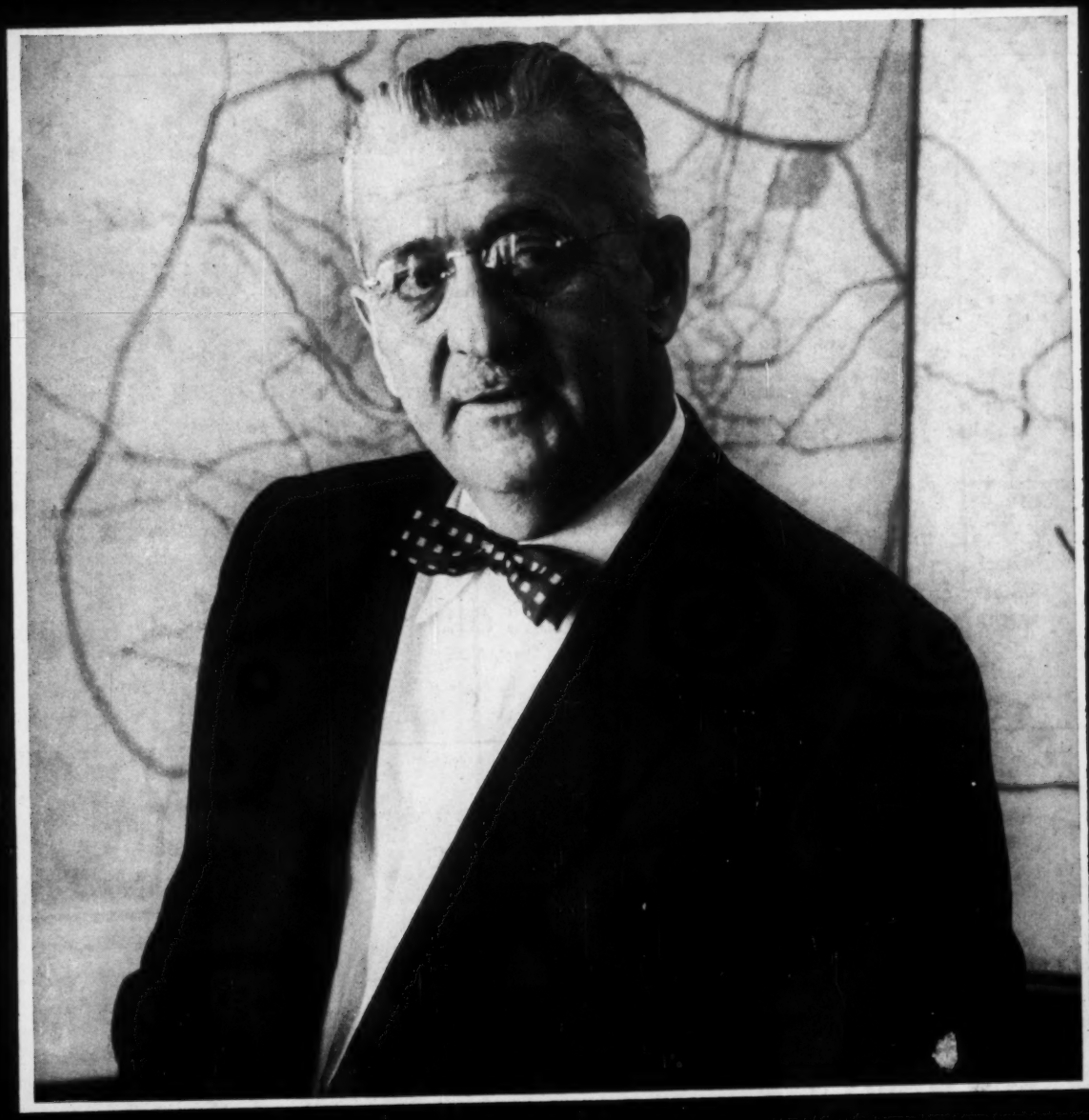
ENGINEERING NEWS-RECORD



★

★

E B POWER GS
UNIVERSITY MICROFILMS
313 N 1 ST
ANN ARBOR MICH

A McGRAW-HILL PUBLICATION

Why Oliver offers two tractors for the same kind of work

Pictured above is the Oliver Super 55 wheel tractor. Below, the "OC-3" crawler. Both do the same kind of work. Both have mounted equipment that includes: front-end loaders, bull-dozers, angling-blade and hydraulic 3-point hitch that takes scrapers, booms, forks, scoops, post diggers and many other tools.

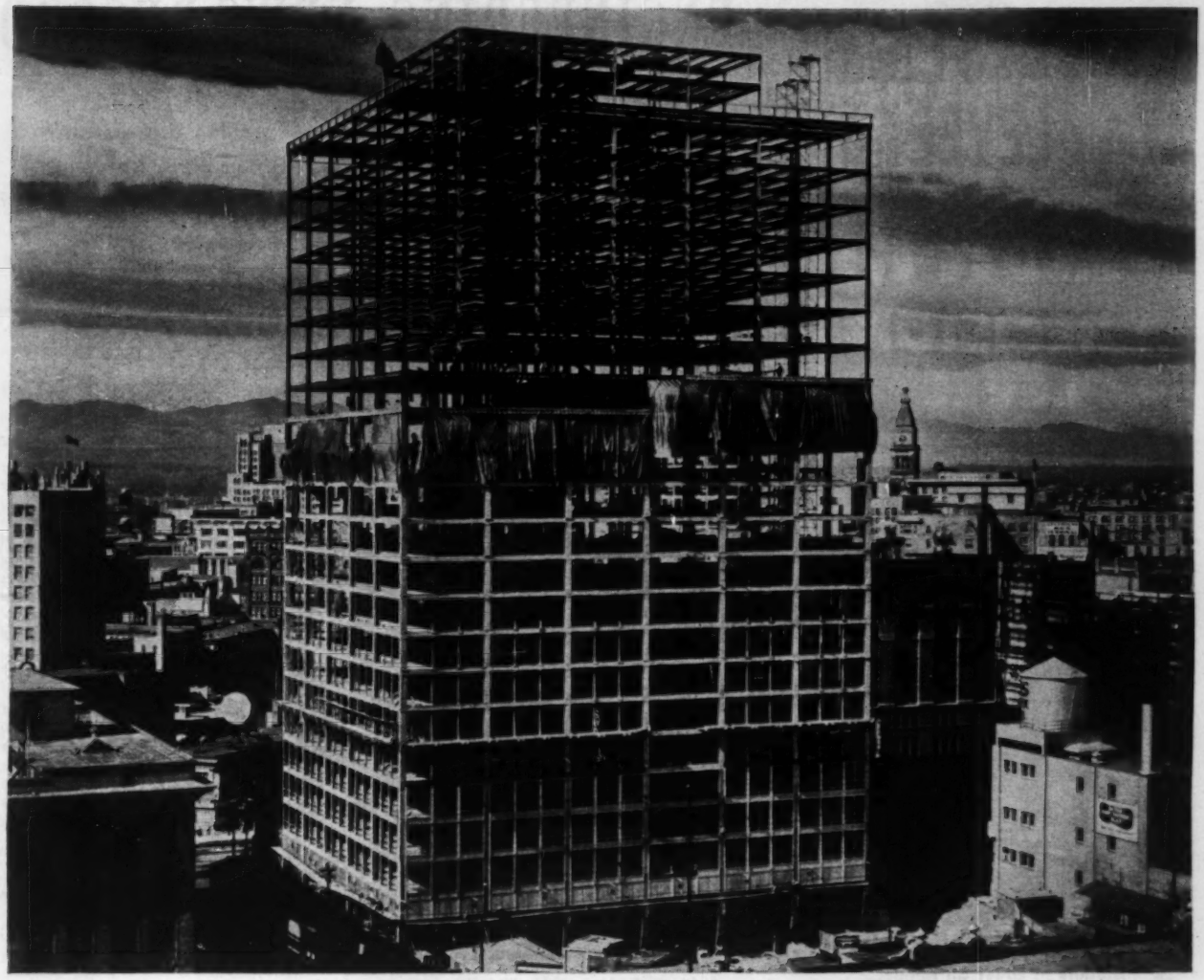
Together these two tractors can produce far more than a single larger crawler or wheel tractor. Put a loader on one, bulldozer on the other and you have a team for any job. A 3-point hitch on each tractor makes equipment twice as useful, half as expensive—buy one tool, use it on either machine. This interchange even includes an all-hydraulic ⅜-yd. backhoe.

These tractors are compact and easy to handle. They get around fast, work in small quarters, take little fuel and can be used in *two* places at one time! And when half this team is a crawler, your work continues year around, in all weather.

If your work does not permit two tractors, then pick the one that fits best, saves the most. The "OC-3" is gasoline powered, the Super 55 offers gas or diesel power. If you want to see these tractors and drive them yourself, or learn about the many mounted tools they use, call or see your Oliver Industrial Distributor.

THE OLIVER CORPORATION
400 W. Madison Street, Chicago 6, Illinois

A complete line of industrial wheel and crawler tractors



Bethlehem High-Strength Bolts were used in erecting this 23-story office building, principal structure of Denver's Mile High Center. With bolting keeping pace with erection crews, the 4600-ton steelwork was completed in 82 working days.

Steel erection moves fast with High-Strength Bolts

Steel erection moves rapidly and smoothly when Bethlehem High-Strength Bolts are used to join the structural members.

Bethlehem High-Strength Bolts save time and promote economy because they can be installed quickly by two men, one using a holding wrench, the other a pneumatic impact wrench. The hexagonal-head bolts are inserted with two hardened washers, one of which is placed under the head, the other under the hexagonal nut. When properly torqued, the bolts remain tight indefinitely.

Bethlehem High-Strength Bolts are furnished in carbon steel in all sizes from ½ in. to 1¼ in., and in varying lengths. Heat-treated by quenching and tempering, they fully meet the requirements of ASTM Specification A-325.

Additional information about Bethlehem High-Strength Bolts is yours for the asking. Simply get in touch with the Bethlehem sales office nearest you.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

Bethlehem Bolts Are Good Bolts

BETHLEHEM STEEL

WORLD'S BEST LEVEL!
WILD'S LEVEL BEST!

WILD N-III
PRECISION
LEVEL

with tilting screw, coincidence level and optical micrometer.

The world's best and most accurate level. For first order geodetic leveling, bridge construction, deflection and settlement studies, mounting of large machinery, jig and alignment work.

Available in the following three models to cover all needs:

a. STANDARD METRIC MODEL, $579.50
Reading direct to .1mm, estimation to .01 mm (Used with WILD Precision Invar Rods)

b. SPECIAL INDUSTRIAL MODEL, $667.00
Reading direct to .001 inch
(Used with WILD Stainless Steel Rods, 3' and 6' long)

c. SPECIAL ENGINEER MODEL, $615.00
Reading direct to .0005 of a foot, estimation to .0001
(Used with Standard Leveling Rods)

WILD®
HEERBRUGG

For details phone or write for Booklet EN 120

•

Full Factory Service by Specialists

WILD HEERBRUGG INSTRUMENTS INC.
MAIN & COVERT STS., PORT WASHINGTON, N. Y.
PORt Washington 7-4843

ENGINEERING NEWS-RECORD

ABP Member ABC

Editorial Offices, 330 W. 42nd St., New York 36, N. Y.

Telephones: New York - LOngacre 4-3000; Chicago - MOhawk 4-5800; San Francisco - DOuglas 2-4600
Washington - REpublic 7-6630

Number of copies of this issue printed 66,284

CONTENTS ON PAGE 17

Waldo G. Bowman

Editor

E. E. Halmos Jr. ..... *Managing Editor*
J. J. Christie ..... *Asst. Managing Editor*
V. T. Boughton ..... *Transportation, Power*
F. S. Merritt ..... *Architectural, Structural*
R. H. Dodds ..... *Contracting, Heavy Construction*
S. C. Jensen ..... *Materials and Equipment*
A. J. Fox Jr. ..... *Hydraulic, Water Supply, Sanitation*
Ross Hazeltine ..... *National Affairs*
J. P. Chamberlain ..... *Business and Finance*
R. W. O'Neil ..... *Highways, International*
J. R. Owen ..... *Municipal*
J. R. Carr ..... *Midwest (Chicago)*
L. L. Wise ..... *West (San Francisco)*
N. A. Bowers ..... *Consultant (San Francisco)*
Elsie Eaves ..... *Business News Department*
J. H. Webber ..... *Economics*
J. A. Mahoney, M. O. Wetzel ..... *Construction Reports*
M. W. Roessler, E. R Huber ..... *Statistics, Costs, Prices*
M. V. Leggiero ..... *Makeup*
B. J. Lamb ..... *Rewrite*
J. C. Greenough ..... *Printing*

Washington News Bureau, Room 1189 National Press Building; G. B. Bryant, Jr., *Manager*, Glen Bayless, A. E. Adams, Jay Flocken, Boyd France, William Gilmour, Sam Justice, D. O. Loomis, Gladys Montgomery, A. L. Moore, William Olcott, M. A. Reichek, Caroline Robertson, J. T. Skelly, V. B. Smith.

Domestic News Bureaus: Atlanta, 1321 Rhodes-Haverty Bldg., W. A. Kearns; **Cleveland,** 1510 Hanna Bldg., R. A. Cochran; **Detroit,** 856 Penobscot Bldg., J. C. Jones Jr.; **Houston,** 1303 Prudential Bldg., J. A. Lee; **San Francisco,** 68 Post Street, M. C. Ralston; **Los Angeles,** 1111 Wilshire Blvd., John Shinn; **Seattle,** 6040 Fifth Ave., N.E., Ray Bloomberg.

Correspondents: Albany, Albuquerque, Augusta, Me., Austin, Boston, Boulder, Baltimore, Birmingham, Bismarck, Charleston (W. Va.), Charleston (S. C.), Columbus, Cincinnati, Cleveland, Chicago, Cheyenne, Dallas, Denver, Detroit, Durham, Harrisburg, Helena, Houston, Hartford, Indianapolis, Jackson, Miss., Jacksonville, Jefferson City, Kansas City (Mo.), Lansing, Lincoln, Little Rock, Miami, Memphis, Minneapolis, Montgomery, Milwaukee, New Orleans, Norfolk, Omaha, Oklahoma City, Philadelphia, Pittsburgh, Portland (Ore.), Providence, Phoenix, Pierre, St. Louis, Schenectady, Syracuse, St. Paul, Seattle, Salt Lake City, Spokane, Topeka, Trenton, Wilmington. **Canada:** Montreal, Toronto, Ottawa, Victoria, Regina.

Mc-Graw-Hill Economics Department: Dexter M. Keezer, director; W. H. Chartener

Foreign News Bureaus: Editor, John Wilhelm; Associate Editor, Georgia Macris, **New York;** G. W. Schroeder, **Bonn;** Edward W. S. Hull, **London;** John H. Kearney, **Mexico City;** John O. Coppock, **Paris;** Dan Kurzman, **Tokyo;** L. J. Holmes, **Sao Paulo. Correspondents:** Amsterdam, Athens, Bangkok, Bogota, Bombay, Brussels, Buenos Aires, Caracas, Copenhagen, Geneva, Havana, Helsinki, Johannesburg, Lima, Madrid, Melbourne, Oslo, Rome, Stockholm, Sydney, Tehran and 21 other principal cities and countries.

Robert F. Boger

Publisher

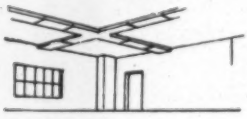
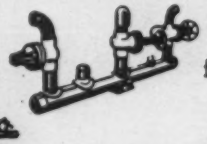
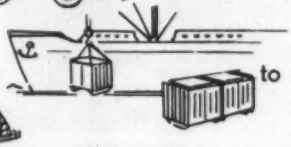
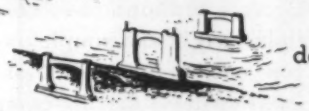
January 20, 1955 ENGINEERING NEWS-RECORD Vol. 154, No. 3

Member ABC and ABP

Published weekly by McGraw-Hill Publishing Company. James H. McGraw (1860-1948), Founder. **Publication Office, 99-129 North Broadway, Albany 1, N. Y.**
Executive, Editorial and Advertising Offices: McGraw-Hill Building, 330 W. 42nd St., New York 36, N. Y. Donald C. McGraw, President; Willard Chevalier, Executieve Vice-President; Joseph A. Gerardi, Vice-President and Treasurer; John J. Cooke, Secretary; Paul Montgomery, Senior Vice-President, Publications Division; Ralph B. Smith, Vice-President and Editorial Director; Nelson Bond, Vice-President and Director of Advertising; J. E. Blackburn, Jr., Vice-President and Director of Circulation.
Subscriptions: Address correspondence to Engineering News-Record—Subscription Service, 99-129 North Broadway, Albany 1, N. Y., or 330 W. 42nd St., New York 36, N. Y. Allow one month for change of address.
Subscriptions are solicited only from persons with an identifiable commercial or professional interest in construction and building. Position and company connection must be indicated on subscription orders.
Single copies 35¢. Subscription rates—United States and possessions, $6.00 a year; $9.00 for two years; $12.00 for three years. Canada $8.00 a year; $12.00 for two years; $16.00 for three years. Other Western Hemisphere and the Philippines, $15.00 a year; $25.00 for two years; $30.00 for three years. All other countries $20.00 a year; $30.00 for two years; $40.00 for three years. Entered as second class matter October 29, 1936, at the Post Office at Albany, N. Y., under Act of Mar. 3, 1879. Printed in U. S. A. Copyright 1955 by McGraw-Hill Publishing Co., Inc.—All Rights Reserved.

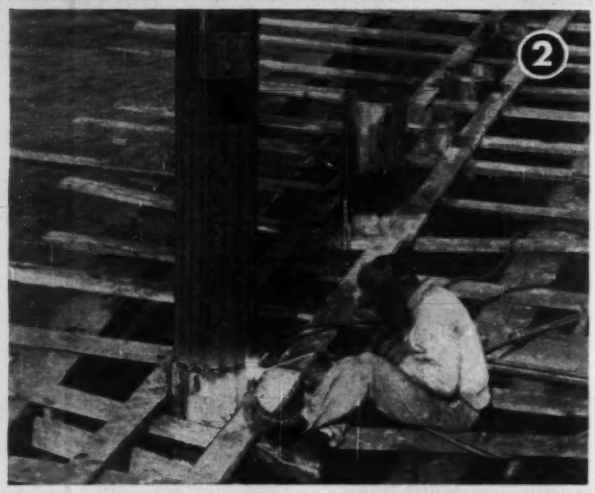
THIS IS DRAVO

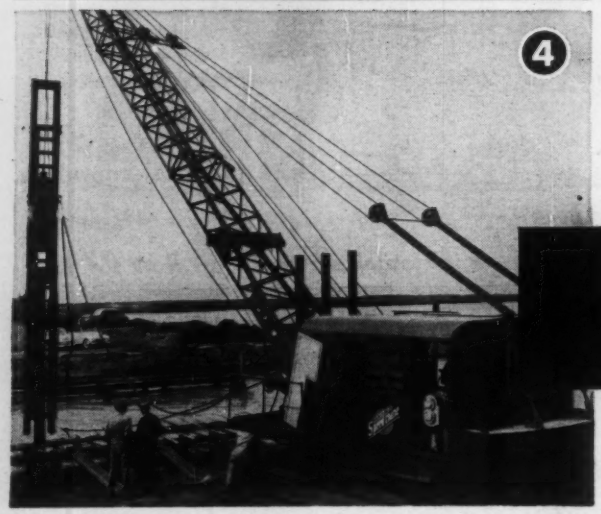
Most people are amazed to learn how many products and services DRAVO has to offer.

For instance, DRAVO and its Subsidiaries build towboats and barges... operate one of the largest barge lines on the inland rivers... manufacture heaters build pumphouses and intakes... install air conditioning  in all types of buildings... handle construction of power plants boiler plants and compressor and oil pumping stations . . . prefabricate and erect piping  for steam, gas, oil, water, etc. . . . construct water and waste disposal plants provide sand, gravel, ready-mixed concrete and builders' supplies for construction projects in the Pittsburgh district . . . furnish construction equipment on rental or sales basis . ... supply open steel flooring . . . manufacture Transportainers  to carry export shipments . . . build giant ore and coal bridges and unloaders . . . construct gantry and floating cranes build bridge foundations  docks, locks and dams dredge . . . sink shafts, drive tunnels and slopes . . . operate one of the nation's most modern marine ways for river-craft repair . . . make crane cab coolers. DRAVO service is founded upon careful engineering, complete facilities and practical know-how.

DRAVO always welcomes an opportunity to demonstrate how these industrial services can work for you.

DRAVO
CORPORATION
PITTSBURGH, PENNSYLVANIA





BIG SAVINGS ...4 WAYS with

MONOTUBE tapered steel piles

THE list of Monotube advantages is long. And you are welcome to *all* the facts . . . anytime. Meanwhile, think of the time and money you can save as a result of . . .

1. FIELD ASSEMBLY. Monotubes can be quickly, easily tailored to required length on the job, minimizing cut-off waste and saving time. Photo shows simplicity of nesting a Monotube extension with a "come-along" and two cable chokers.

2. SIMPLIFIED EXTENDIBILITY. When piles cannot be driven in one piece, Monotubes are readily welded and extended to *any* length as driving progresses. You eliminate complicated welding procedure by using a simple "girt" weld under normal driving conditions.

3. EASY CUT-OFF. With lightweight Monotubes, the cut-off operation is fast and easily accomplished. Careful use of cut-off sections as extensions minimizes waste.

4. DRIVING LONG PILES WITH SHORT LEADS. Because of Monotubes' cold-rolled strength, light weight and simple on-the-job extendibility, you can save the expense of special rigs, long leads or heavy driving equipment on tough jobs. Photo shows standard crane with short lead driving 150-ft. Monotube, in sections, 58 feet from shore.

For complete information, for more evidence that you'll be 'way ahead with Monotube piles, write to The Union Metal Manufacturing Co., Canton 5, Ohio.

UNION METAL

Monotube Foundation Piles

B.F.Goodrich

All-Nylon All-Purpose tires help build Kansas county highways

TWENTY-EIGHT units are constantly kept busy building and maintaining the network of roads that crisscross Marion County, Kansas. Tons of fill dirt, rock and gravel must be hauled 48 hours a week over back roads, often over no roads at all.

MASSIVE CLEATS in the All-Purpose tread are curved for greater gripping action. "Buttons" on alternate cleats defy slippage. And the center rib of this BFG tire widens as it wears, putting more and more rubber on the road for longer service.

The result could be a high rate of tire mortality if the county didn't use new B. F. Goodrich *all-nylon* All-Purpose tires. This is the tire that's built upside down to resist rock bruises far better than ordinary tires. Instead of having breakers just on top of the plies, the All-Purpose in addition has special breakers between the *bottom* plies to guard against bruises that start inside the tire.

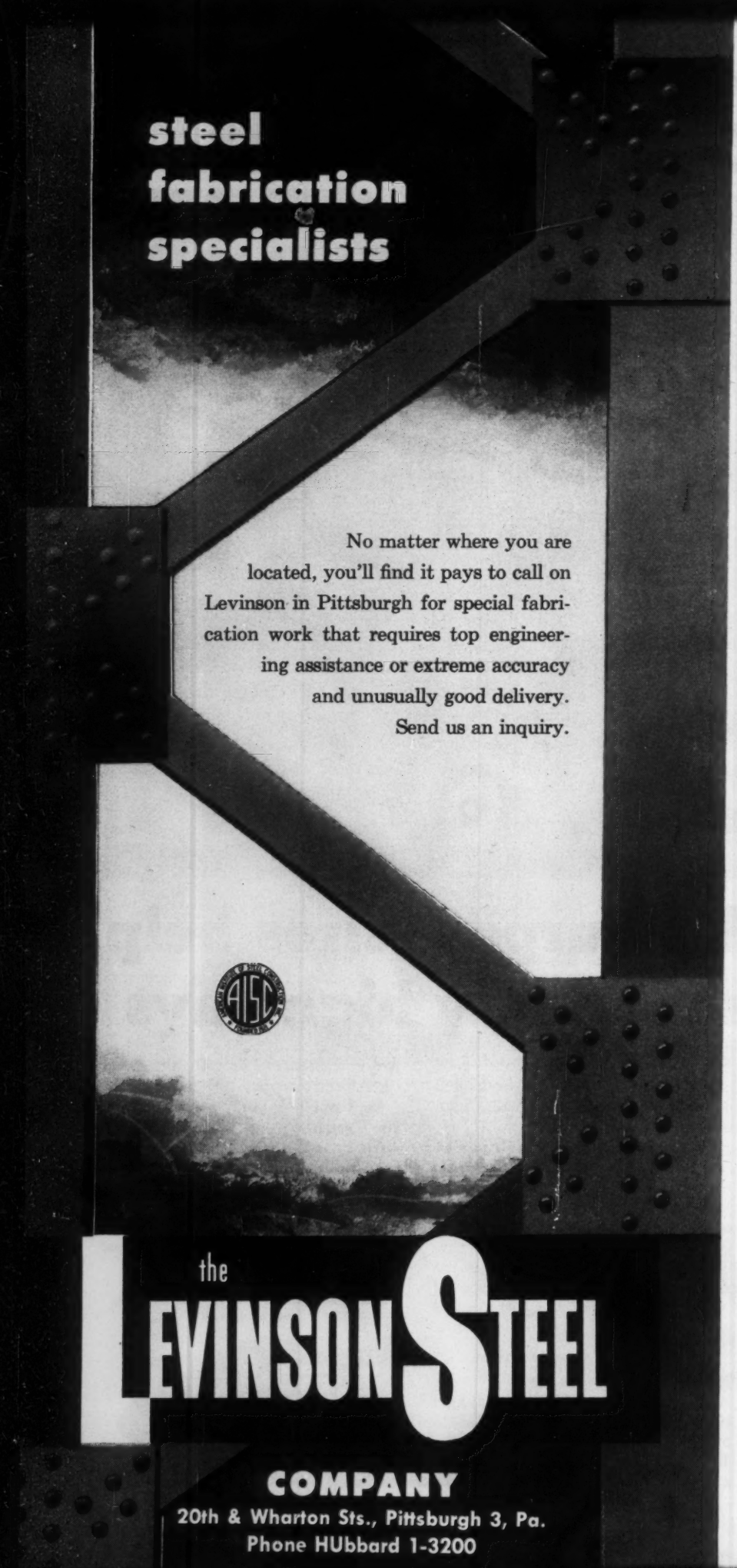
All-Nylon Construction

B. F. Goodrich builds the All-Purpose with an *all-nylon* body. Nylon is stronger than ordinary cord materials, can withstand double the impact. This B. F. Goodrich tire outwears even its extra-thick tread—as much as 67% deeper than that of a regular tire—and can still be recapped over and over!

Find out how much more mileage you'll get, how much money you'll save, with B. F. Goodrich *all-nylon* All-Purpose tires (also in rayon at lower prices). Your B. F. Goodrich retailer is listed under Tires in the Yellow Pages of your phone book. Or write *The B. F. Goodrich Co., Tire & Equipment Division, Akron 18, Ohio.*

Specify B. F. Goodrich tires when ordering new equipment

RESEARCH KEEPS
B.F.Goodrich
FIRST IN RUBBER


steel
fabrication
specialists
No matter where you are located, you'll find it pays to call on Levinson in Pittsburgh for special fabrication work that requires top engineering assistance or extreme accuracy and unusually good delivery. Send us an inquiry.
AISC
the
LEVINSON STEEL
COMPANY
20th & Wharton Sts., Pittsburgh 3, Pa.
Phone HUbbard 1-3200

READER COMMENT

Atomic Power Problems

SIR: Rarely has the engineering profession been so stirred in all its branches as now when anticipating forthcoming developments in the atomic energy field. Committees and conferences of varying weight are being set up right and left. On scrutinizing their composition, one is impressed with the general failure to include dissident points of view.

Unless this drift can be corrected, the engineering profession may be in for an experience comparable to that which a quarter of a century or more ago accompanied the espousal by the leadership of the larger engineering groups of the fallacious reproductions-cost-new theory of valuation. And this was no trifling matter. This erroneous concept added many hundreds of millions to alleged plant values—especially of electrical utilities. And it took away in inflated rates tens of millions from those least able to pay. It is impossible to estimate the drop in public esteem which the engineering profession suffered when the opposing theory of prudent investment valuations became the uncontested law of the land.

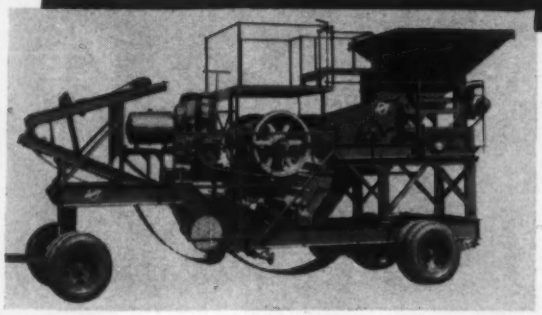
No one can foretell all the clashing viewpoints that will develop between public and private interests, or between various private interests, as the dream of atomic energy unfolds. The recent Congressional debates on the Atomic Energy Act of 1954 pinpointed some of the conflicts, but the final act did not seem to settle any major question. Neither the public nor private spokesmen were satisfied with either the patent provisions or the electric-power provisions. A large private segment is not satisfied with the basic provision that all fissionable materials shall be federally owned. Some still want and will seek the right of private ownership of fuel materials, although they are capable of conversion to weapons use.

The proponents of public power development are dissatisfied that no federal agency was authorized and directed to construct reactors for generation of electricity. Some of them believe, on the basis of General Electric Company estimates, that reactors can now produce economic electricity for use in high-power-cost areas of the United States if publicly financed, but that these plants are being withheld because private inter-

(*Continued on page 8*)

FOR PRODUCING *LOW COST* ROAD BUILDING AGGREGATE

TELSMITH *SINGLE PASS* Scalping and Crushing Plant



The Town of Brasher, New York, gets about 60 cubic yards per hour from its Telsmith 1424 Single Pass Portable Scalping and Crushing Plant. Plant feed is about 50% sand, 50% gravel, with a large percentage to be crushed. The low cost aggregate produced is used as base fill on township roads. Highly mobile, this plant is easily and quickly moved from pit to pit. Nothing to remove; traveling height is low. Just unfold hinge conveyor, lower support jacks, start the engine—you're in production. Four sizes: 1021 to 1036. Get Bulletin 288.

✓ Check all these TELSMITH advantages

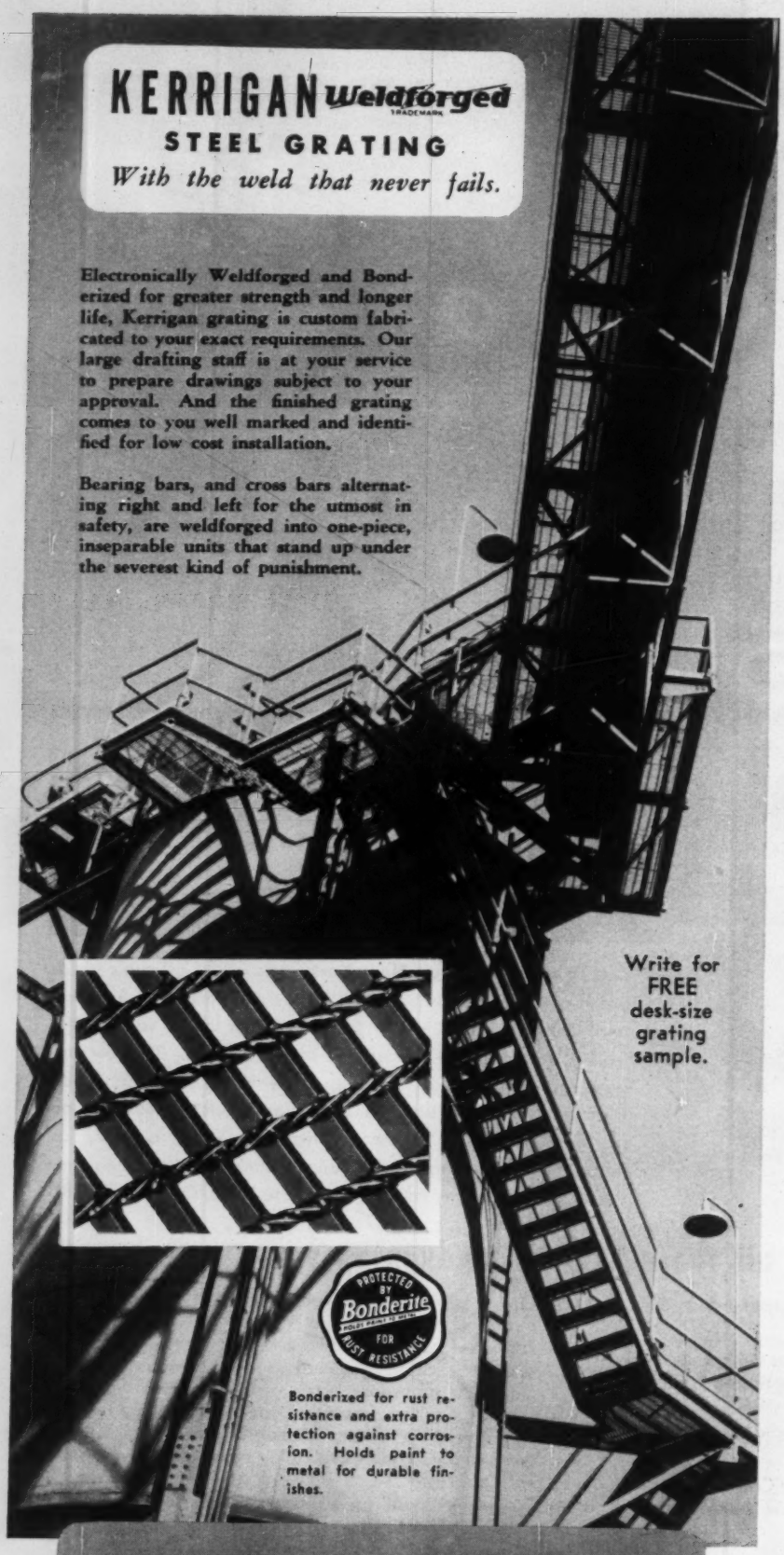
- Large 1¾ cubic yard receiving hopper—6′ x 6′-4″ opening with removable bar grizzly.
- Heavy-Duty Reciprocating Plate Feeder with adjustable stroke, roller bearings and Twin Disc controlled from both ground and operator's platform.
- Telsmith Heavy-Duty Scalping Screen with four roller bearings.
- Telsmith Heavy-Duty Roller Bearing Jaw Crusher has CAST STEEL FRAME—long jaw dies for low percentage of oversize.
- Operator's platform with removable guard rail located near hopper, screen and crusher.
- Folding Type Belt Conveyor with highly efficient wrap drive, self-cleaning pulleys and three-point belt take-up.
- Entire transmission equipment has double-row, self-aligning roller bearings, perfectly sealed—bearings adjustable for wear, all sprockets have hardened cut teeth and all chains are roller type. All drives protected with guards.
- Brakes—manual or air operated—can be furnished at additional cost.

P-20

SMITH ENGINEERING WORKS

500 E. CAPITOL DRIVE **MILWAUKEE 1, WISCONSIN**

Representatives in Principal Cities in All Parts of the World • **Cable Address: Songworks, Milwaukee**


KERRIGAN Weldforged
TRADEMARK
STEEL GRATING
With the weld that never fails.
Electronically Weldforged and Bonderized for greater strength and longer life, Kerrigan grating is custom fabricated to your exact requirements. Our large drafting staff is at your service to prepare drawings subject to your approval. And the finished grating comes to you well marked and identified for low cost installation.
Bearing bars, and cross bars alternating right and left for the utmost in safety, are weldforged into one-piece, inseparable units that stand up under the severest kind of punishment.
Write for FREE desk-size grating sample.
PROTECTED BY Bonderite FOR RUST RESISTANCE
Bonderized for rust resistance and extra protection against corrosion. Holds paint to metal for durable finishes.
KERRIGAN IRON WORKS, Inc.
General Sales Office — 274 Madison Ave. — New York City

READER COMMENT

ests are not yet ready to introduce atomic energy. They feel that government yardstick developments are necessary, both as a measure of cost and as a measure of feasibility.

Virtually all of the basic policy questions remain open. For instance: Should the government retain title and control over all of the basic fissionable material? Should these materials, brought to usefulness by government research and development programs costing billions, be regarded as a part of the public domain, and so administered? Should licenses for the use of public fissionable material to generate electric power contain the same sort of safeguards as those thrown around hydro-electric resources, such as right to recapture, non-capitalization of license values, rates based on prudent investment?

If fissionable material is not to be treated as public property, what consideration should be given by private interests to the expenditure of billions of dollars by the government for the development of the basic art before private interests entered the field? Should right to patent be delayed until all citizens have an equal opportunity to learn the new art and enter the field? Should energy producers and merchants other than electric power companies have equal opportunity to acquire know-how in the atomic energy field before patenting is permitted? Should exclusive-right patents ever be issued, or should patents be subject permanently to mandatory licensing? How should fees for use of patents be set? What consideration should be given in establishment of royalties to the great basic public discoveries?

How should monopoly be controlled or prevented? Should past serious anti-trust law offenders be entrusted with exclusive patents? Should there be limitations on the extent of control over our society which one or a small group of private interests might exercise? For example, should a private monopoly be permitted to control, by patent, the use of fissionable materials to produce energy, determining what companies, cities or areas might get plants? Should there be regulation of use or non-use of new inventions and discoveries (1) to prevent withholding of useful new developments, and (2) to regulate the introduction into our society of new discoveries which might otherwise drastically and suddenly disrupt established industrial and employment patterns?

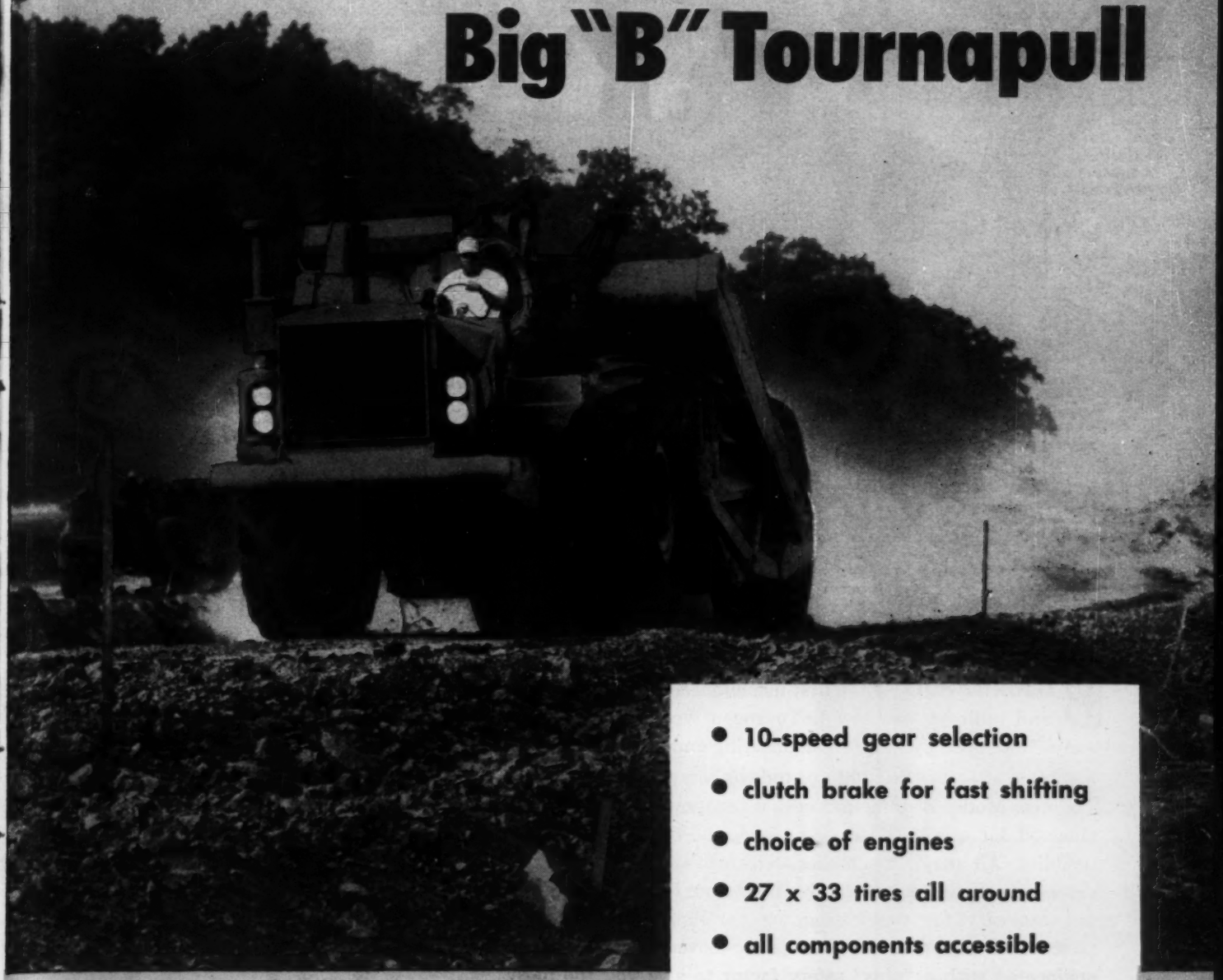
The task of locating dissident and

(Continued on page 13)

NEW

18 yds. struck
23 yds. heaped
without sideboards

Big "B" Tournapull

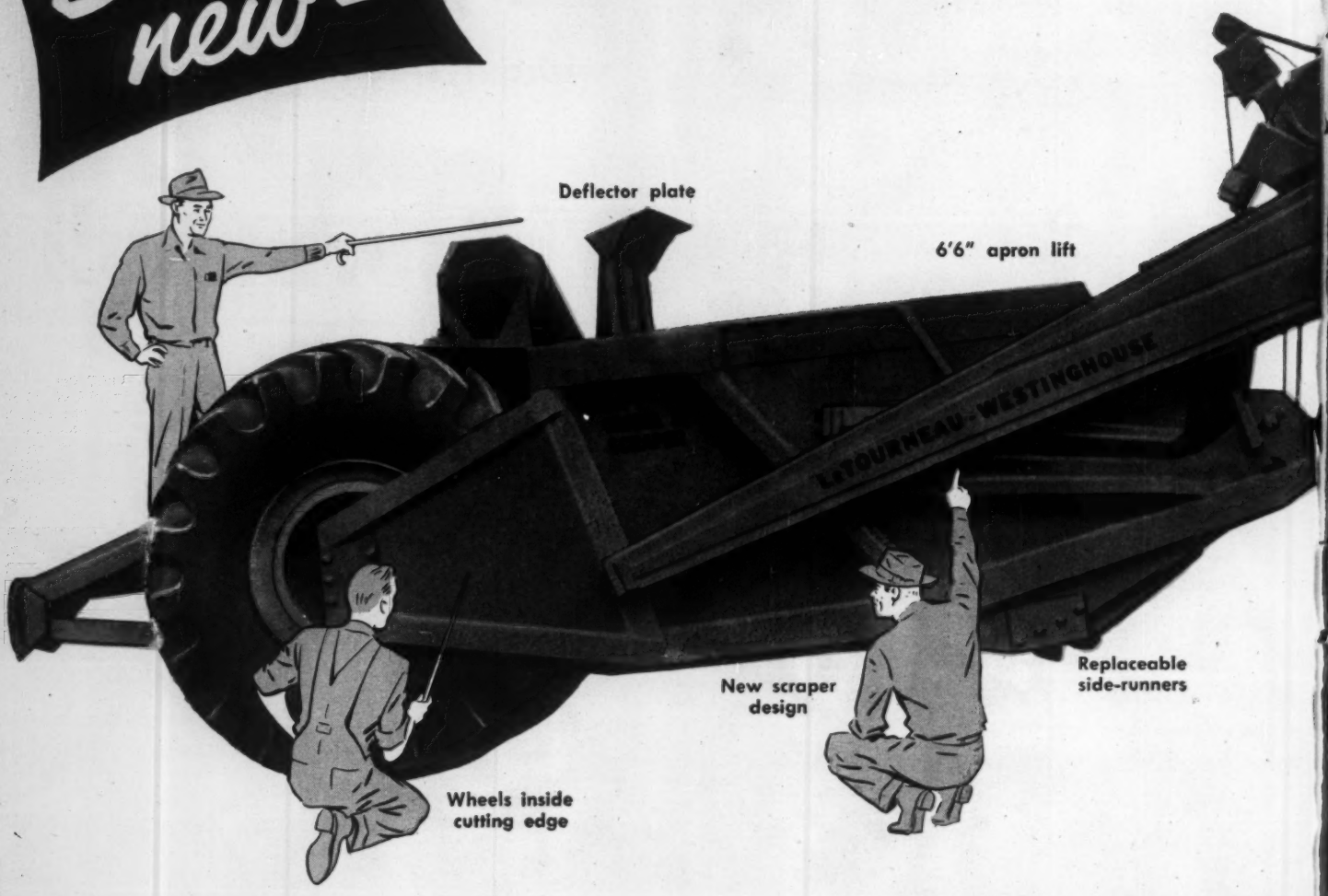


- 10-speed gear selection
- clutch brake for fast shifting
- choice of engines
- 27 x 33 tires all around
- all components accessible
- "feather-touch" power steer

See following pages for details

on this big new scraper

Brand new — from the ground up...the

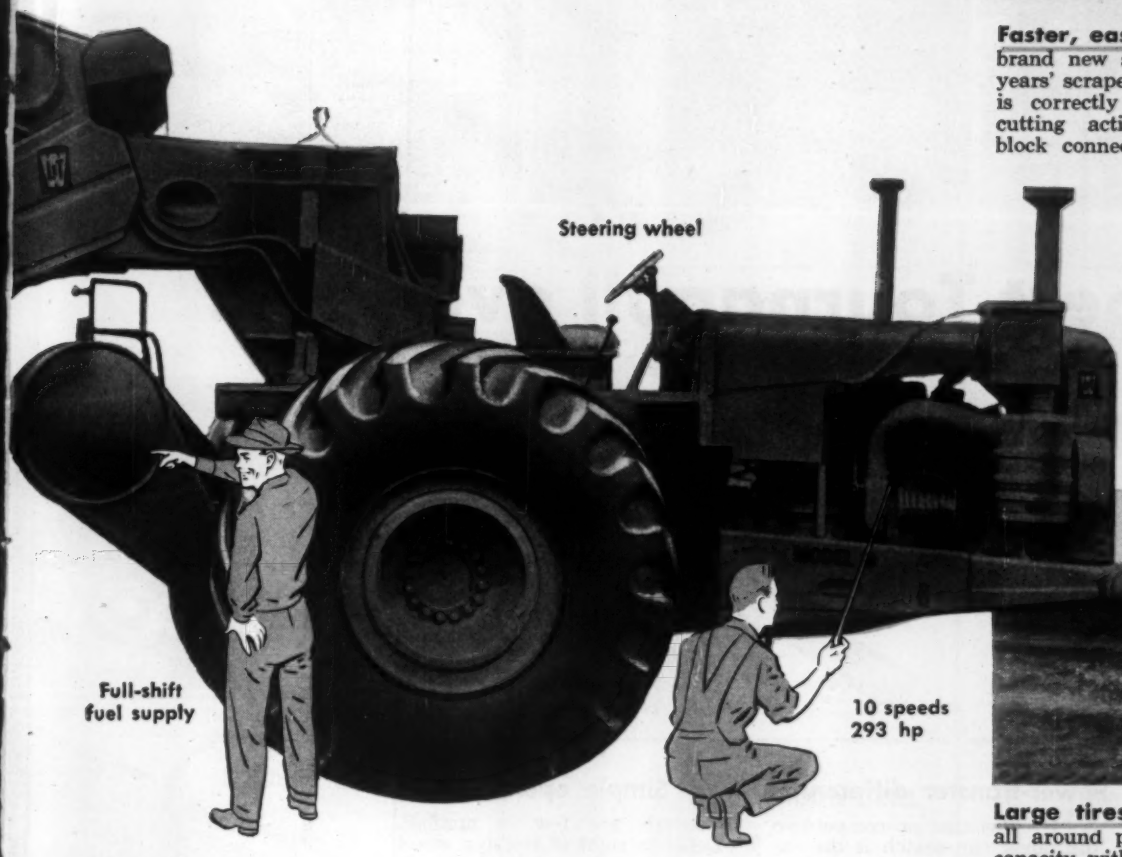


B TOURNAPULL is the first machine completely designed and built by the new LeTourneau-Westinghouse Company. Developed by our new engineering and research staff, it was built after careful study of today's scraper requirements. The *new* Model B prime-mover is a big, powerful tractor engineered for quick and easy replacement of component assemblies. All major assemblies — transmission, clutch, final drive, differential, etc. — can be lifted from the machine without necessity for time-consuming handling of other components. Every part of both prime-mover and scraper is engineered with a "plus" safety factor to give you the most rugged scraper unit ever built. Prototypes of the "B" were put through rugged tests on our new proving grounds. They were then tested on-the-job by leading contractors in all types of materials under rugged field conditions. The new LeTourneau-Westinghouse Company has carefully and thoroughly designed, tested and job-proved this new "B" Tournapull before putting it into production.

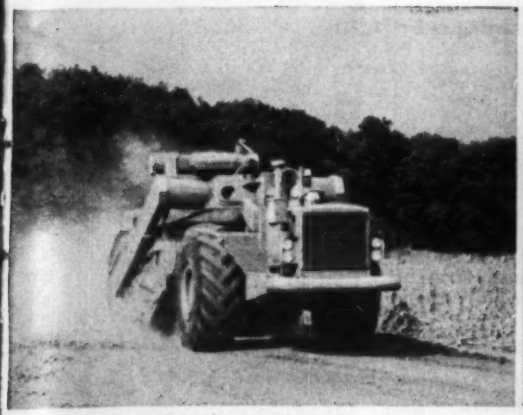
Biggest single-engine self-propelled scraper on the market. "B" packs in 18 cu. yds., struck, or 23 cu. yds. heaped, *without sideboards.* New scraper design makes for easy loading. Proper weight distribution that puts 56% of loaded scraper weight on drive wheels, plus 293 hp of diesel power, help get heaped loads in a hurry. You have a choice of Cummins or GM engines for standardization with other equipment in your fleet.

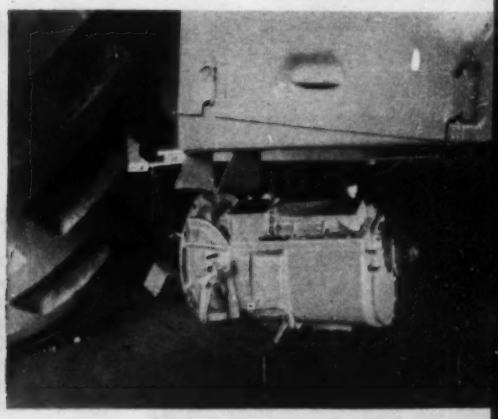
new 23-yd. B Tournapull

Faster, easier loading is a feature of brand new scraper design based on 36 years' scraper building experience. Blade is correctly angled for most efficient cutting action. Newly-designed push-block connects with scraper bottom as well as side sheets. This gives direct action to utilize full power of push-tractor for faster easier loading. Deflector plate at rear of bowl and curved apron provides easy boiling action. Scraper wheels track inside cutting edge. Apron lifts 6'6" to permit free ejection of any material. Cables are short. Welded box-beam construction increases strength, lowers deadweight.



Large tires (27.00 x 33, 30 ply) used all around provide ample load-carrying capacity without overloading. Tires and wheels are interchangeable between prime-mover and scraper. One spare serves your entire fleet.





Ten gear ratios allow you to select working speed best suited to underfoot conditions. Low gear matches pusher speed, enables "B" to help itself in loading . . . gives full lugging power for pulling through soft going. Clutch brake permits fast shifting without gear clashing. No double-clutching is necessary. This combination of 10 speeds, plus clutch brake for fast shifting, means hauling at higher speeds . . . more trips per hour.

Instant-response, positive electric controls are simpler and trouble-free. New feather-touch power-steer gives you feel of the road. Tailgate and apron are controlled by a single control switch. Tailgate moves forward automatically as soon as apron reaches full raised position. All electric motors, including steering motor, are in the open for easy adjustment when necessary. Electric controls enable operators to do better work all day long.

Easy accessibility of all components facilitate quick servicing and repair. Disassembly is easy. For instance, you can drop transmission in less than an hour without pulling engine. Bolt sizes are held to a minimum. Quick disconnects are used wherever possible. Drain and fill plugs are easily accessible. Number of lube points and types of lubricants are reduced to lowest practical limits. Large fuel tank with ten-hour supply is provided.

This B Tournapull was tested on a road job near Momence, Illinois. Unit was later shifted to a section on Indiana Turnpike. All test models were given punishing treatment so trouble spots would show up for correction.

"B" shown here hauled sand and tough lower-magnesium limestone on highway work at Hager City, Wisconsin. Big 4-wheel air brakes (7536 sq. in. total brake surface) and power steer provide ample safety margin.

Another new "B" prime-mover gets additional testing on installation in West Virginia. Its 35-ton Rear-Dump trailing unit is interchangeable with the 23-yd. Scraper described on this and preceding pages.

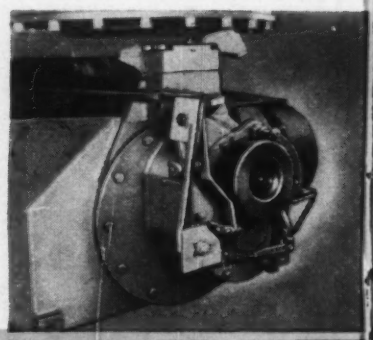
The best Tournapull ever built

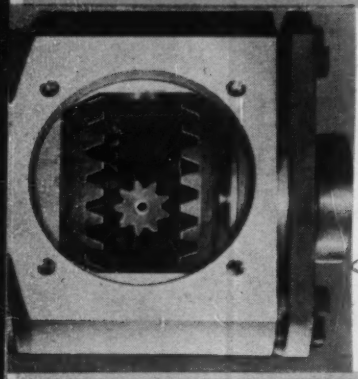
90° turns

Despite its size, the "B" machine can turn around non-stop in space 35′ wide. Its 90° maneuverability will pay off in narrow cuts and fills.

Positive parking brake

Simple brake on output shaft of transfer case gives you safe, sure parking. Brake is mounted out in open for quick adjustment. Parts are few.



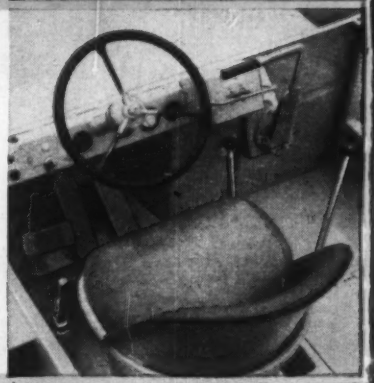


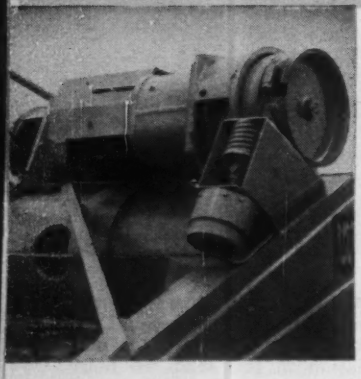
Power-transter differential

A "B" plus that no competitive dirtmover can match is the exclusive power-transfer differential. Unit automatically keeps power flow equal and constant to both drive wheels . . . prevents spin of wheel on poor footing. "B" keeps going through soft fills and soggy cuts where other machines hang up.

Simple operation

Controls are few in number. Lever to right of steering wheel raises and lowers bowl. Single pushbutton control synchronizes apron and tailgate action. Other levers are shift lever, transfer case lever, and hand throttle. Floor pedals operate accelerator, clutch, and brake. Starting is by dashboard pushbutton.





Instant bowl drop

Quick-release allows gravity drop of bowl, but retains efficient electric controls for hoisting. This enables you to "pump" loads . . . work effectively in sand and other loose materials . . . keep material boiling for big loads. Precision control by electricity lets you adjust bowl height within fraction of inch for accurate loading, spreading.

Better pusher contact

Push-block is low to direct push-tractor's thrust efficiently straight to blade. Block is rigidly reinforced.

Details shown on this page are only a portion of the many design features you'll find in this "new from the ground up" prime-mover and scraper.

Tournapull—Trademark Reg. U.S. Pat. Off. BP-767-G

Find out all about B Tournapull. See it work. Analyze its speed and production possibilities. Study the flotation and maneuverability of this new machine. Compare price per yard of capacity. Before you buy be sure you check *all* details on the *new* LeTourneau-Westinghouse B Tournapull. It's available now!

LeTourneau-Westinghouse Company

PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

READER COMMENT

dependable points of view is admittedly not an easy one. But unless it can be reasonably met we will again run the risk of arraying the engineering profession against easily recognized public interests. At this stage of the world's social development any distinction for the engineer worth having—individually or collectively—must lie in a proper regard for public interests.

This fact should not be overlooked in selecting speakers for the Nuclear Congress now being planned by Engineers Joint Council for the fall of 1955.

MORRIS LLEWELLYN COOKE
Consulting Engineer,
Philadelphia, Pa.

Associates

SIR: In the Dec. 9 issue, we note on page 26 a statement as to two buildings in which we are involved.

The one at 425 Park Avenue is correctly stated but that for Seagram's is inaccurate.

The Architects for Seagram's are Mies Van Der Rohe and Philip Johnson, with Kahn and Jacobs as Associate Architects.

ELY JACQUES KAHN
Kahn & Jacobs, Architects
New York

CALENDAR

Associated Equipment Distributors, annual meeting, Conrad Hilton Hotel, Chicago, Jan. 23-27.

Mason Contractors Association of America, annual convention, Jefferson Hotel, St. Louis, Jan. 30-Feb. 2.

Seventh California Street & Highway Conference, Institute of Transportation and Traffic Engineering, University of California, Berkeley, Calif., Feb. 2-4.

Association of Asphalt Paving Technologists, annual meeting, Jung Hotel, New Orleans, La., Feb. 7-9.

American Society of Civil Engineers, convention, U. S. Grant Hotel, San Diego, Calif., Feb. 7-12.

National Society of Professional Engineers, spring meeting, Hotel Charlotte, Charlotte, N. C., Feb. 18-19.

American Concrete Institute, annual convention, Hotel Schroeder, Milwaukee, Wis., Feb. 21-24.

Annual Highway Engineering Conference of the University of Colorado, Boulder, Feb. 24-25.

Concrete Contractor's Association of Greater Chicago, Mid-West Concrete Exposition, Navy Pier, Chicago, Feb. 24-26.

Association of Highway Officials of the North Atlantic States, annual convention, Hotel Traymore, Atlantic City, N. J., March 2-4.

National Association of Corrosion Engineers, annual conference, Palmer House, Chicago, March 7-11.

SCHRAMM
adds this essential tool to its Line!
SUMP PUMP

The Schramm pneumatic sump pump will remove 370 gpm of water (at 10 feet head) from excavations, flooded cellars, etc., so that work can be quickly resumed. Now ready for immediate delivery. Use coupon below for complete specifications and prices.

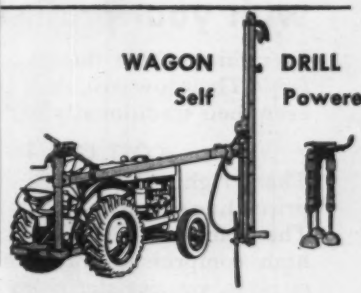
ROCK DRILL

PAVING BREAKER

SPADES

TAMPER

WAGON DRILL


WAGON DRILL Self Powered

SCHRAMM, INC.
WEST CHESTER PENNSYLVANIA
SCHRAMMAIR YOUR JOBS

Schramm, Inc.
West Chester, Pa.

Please send me Bulletin SP-55 on Schramm's new Sump Pump.

Name_____

Company_____

Address_____

City_____ Zone____ State_____

NEW CHEVROLET TRUCKS

engineered and designed with your profit in mind!

Everything about these new Chevrolet trucks spells *profit!* Their low cost, their stamina and dependability, even their traditionally higher resale value!

COST LESS TO BEGIN WITH

That's right, Chevrolet brings you America's lowest-priced line of trucks—so you save right from the start. The beauty of it is, you go right on saving! With the high compression ratio of Chevrolet's three great engines, you register more miles on the job for each tankful of gas. You can count on fast starts; easy pulling up steep grades. You stay on schedule and keep the profits coming in *on time!*

COST LESS TO MAINTAIN

That's because of the rugged strength and stamina engineered into every new Chevrolet truck. They stay on the job longer (actual owner reports prove it!), cutting your maintenance costs right to the bone. Look over the many advance-design features in the next column and you'll begin to see why.

Your best bet is to talk trucks with your Chevrolet dealer. He'll tell you all you want to know about these Chevrolet profit-makers! . . . Chevrolet Division of General Motors, Detroit 2, Michigan.

CHEVROLET

CHEVROLET ADVANCE-DESIGN TRUCK FEATURES

THREE GREAT ENGINES—The "Jobmaster 261" engine* for extra heavy hauling. The "Thriftmaster 235" or "Loadmaster 235" for light-, medium- and heavy-duty hauling. **TRUCK HYDRA-MATIC TRANSMISSION***—offered on ½-, ¾- and 1-ton models. Heavy-Duty **SYNCHRO-MESH TRANSMISSION**—for fast, smooth shifting. **DIAPHRAGM SPRING CLUTCH**—positive-action engagement. **HYPOID REAR AXLE**—for longer life on all models. **TORQUE-ACTION BRAKES**—on all wheels on light- and medium-duty models. **TWIN-ACTION REAR WHEEL BRAKES**—on heavy-duty models. **DUAL-SHOE PARKING BRAKE**—greater holding ability on heavy-duty models. **RIDE CONTROL SEAT***—eliminates back-rubbing. **LARGE UNIT-DESIGNED PICKUP AND PLATFORM STAKE BODIES**—give trip-saving load space. **COMFORTMASTER CAB**—offers greater comfort, convenience and safety. **PANORAMIC WINDSHIELD**—for increased driver vision. **WIDE-BASE WHEELS**—for increased tire mileage. **BALL-GEAR STEERING**—easier, safer handling. **ADVANCE-DESIGN STYLING**—rugged, handsome appearance.

**Optional at extra cost. Ride Control Seat is available on all cabs of 1½- and 2-ton models, standard cabs only in other models. "Jobmaster 261" engine available on 2-ton models, truck Hydra-Matic transmission on ½-, ¾- and 1-ton models.*

CLINTON WELDED WIRE FABRIC

builds long-lasting culverts...

The ideal culvert incorporates high strength to resist heavy loads and freedom from corrosion. From these two viewpoints—either in new construction or repair—concrete pipe reinforced with Clinton Welded Wire Fabric meets the toughest requirements.

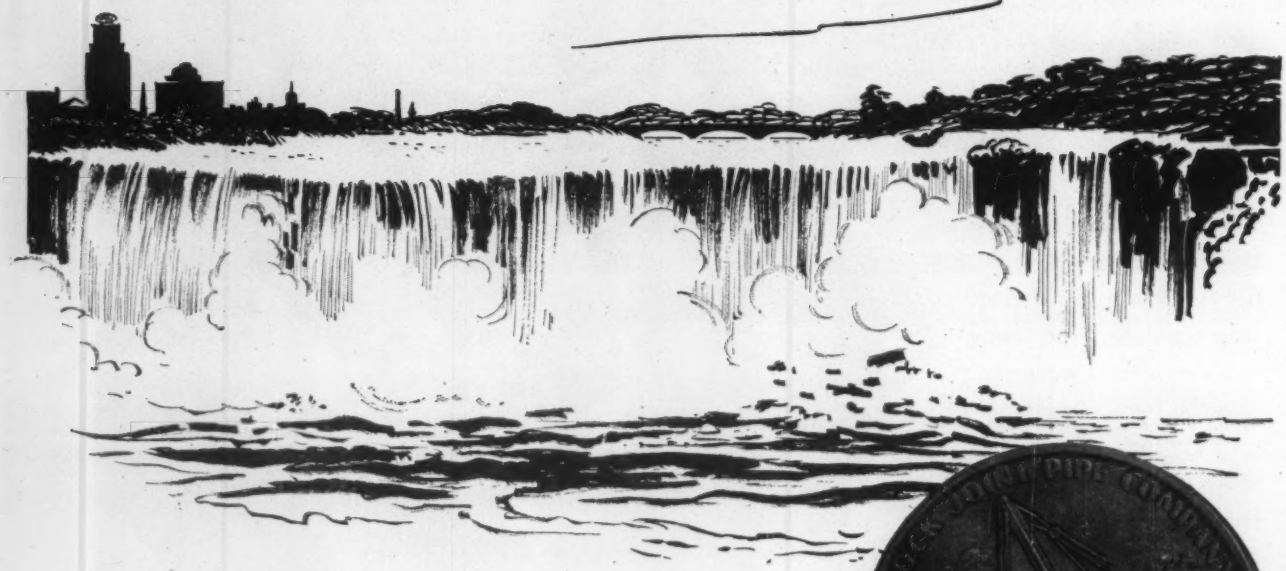
Clinton Welded Wire Fabric meets A.S.T.M. specifications for reinforcement in concrete pipe and is available in a wide variety of gauges and spacings for every requirement. Write to our nearest District Sales Office for further information.

CLINTON
WELDED WIRE FABRIC
PRODUCT OF WICKWIRE SPENCER STEEL DIVISION
THE COLORADO FUEL AND IRON CORPORATION
CFI

WICKWIRE SPENCER STEEL DIVISION • Atlanta • Boston • Buffalo • Chicago • Detroit • New Orleans • New York • Philadelphia
THE COLORADO FUEL AND IRON CORPORATION • Albuquerque • Amarillo • Billings • Boise • Butte • Casper • Denver • El Paso • Ft. Worth • Houston • Lincoln (Neb.)
Los Angeles • Oakland • Oklahoma City • Phoenix • Portland • Pueblo • Salt Lake City • San Francisco • Seattle • Spokane • Wichita
CANADIAN REPRESENTATIVES AT • Calgary • Edmonton • Toronto • Vancouver • Winnipeg

2639

580 times more water than flows over Niagara Falls!



IN 50 YEARS Lock Joint Pipe Company has developed and produced concrete pressure pipe for countless water works installations throughout the world. Today, at any given second of the day or night, these pipes are transporting better than 1,000,000,000 gallons of water — or more than 580 times as much water as is flowing over Niagara Falls.

This is the measure of the tremendous contribution Lock Joint Pipe has made, over the past half century, toward meeting one of civilization's most serious problems — water supply.

You may be sure that every resource of skill, experience and research at our command is at this very moment working on the answers to the even greater problems we must meet in the *next* 50 years!

LOCK JOINT PIPE COMPANY

Established 1905

P. O. Box 269, East Orange, N. J.

Sales Offices: Chicago, Ill. • Columbia, S. C. • Denver, Col. • Detroit, Mich. • Hartford, Conn. • Kansas City, Mo.

ENGINEERING NEWS-RECORD

Vol. 154, No. 3 January 20, 1955

Number of copies of this issue printed: 66,284

CONTENTS

NATIONAL AFFAIRS

Construction Funds Add Up to $5 Billion in '56 Budget 21
Highway Plan Draws Both Cheers, Criticism 23
ARBA Examines Highway Plan 24
Consulting Engineer Sets Up Foundation to Aid Students 25
School Aid Law Is Good Bet 25
Tunnel Triumph at Tecolote 26
Table of New Water Projects and Resumptions 26
Engineers Selected to Plan Mississippi Bridge Approach 27
Jobs in the News 27
New York Plans Bridges on Grand Scale 28

FEATURES

How to Stretch Soil-Survey Dollars 35
Problem: $7-Million County Road Net 39
Mixing Machine Speeds Folsom Dam Grouting 45
How Soon for Mica Creek? 47

NEW PRODUCTS

Dustless Drilling: It's Faster, Cheaper, Safer 53
Triple Electrode Spark Plug Said to Cut Fuel Consumption 55
Publications 56

MEN AND JOBS

ASEE Elects Prof. William L. Collins Executive Secretary 59
Public Works Directorship Changes Hands in Ohio 59
George S. Bartlett Award Goes to J. A. Anderson 59

BUSINESS AND FINANCE

The Longer Look 77
Clay Report Gets Going-Over at Highway Finance Meeting 78
New Governor Checks Into Connecticut's Expressway 80
Activity This Week 81

LABOR

Puget Sound Is Losing Lead in Western Bargaining 82
Workmen's Compensation Law No Aid to Prime Contractor 82
Lower California Builders Agree to Union Surveying 82

Reader Comment 6
Calendar 13
Washington Observer 19
City by City 32
Obituaries 60
Legal 61
Construction Reports 64
Unit Prices 74
Editorials 96

THE CONSTRUCTION WEEK

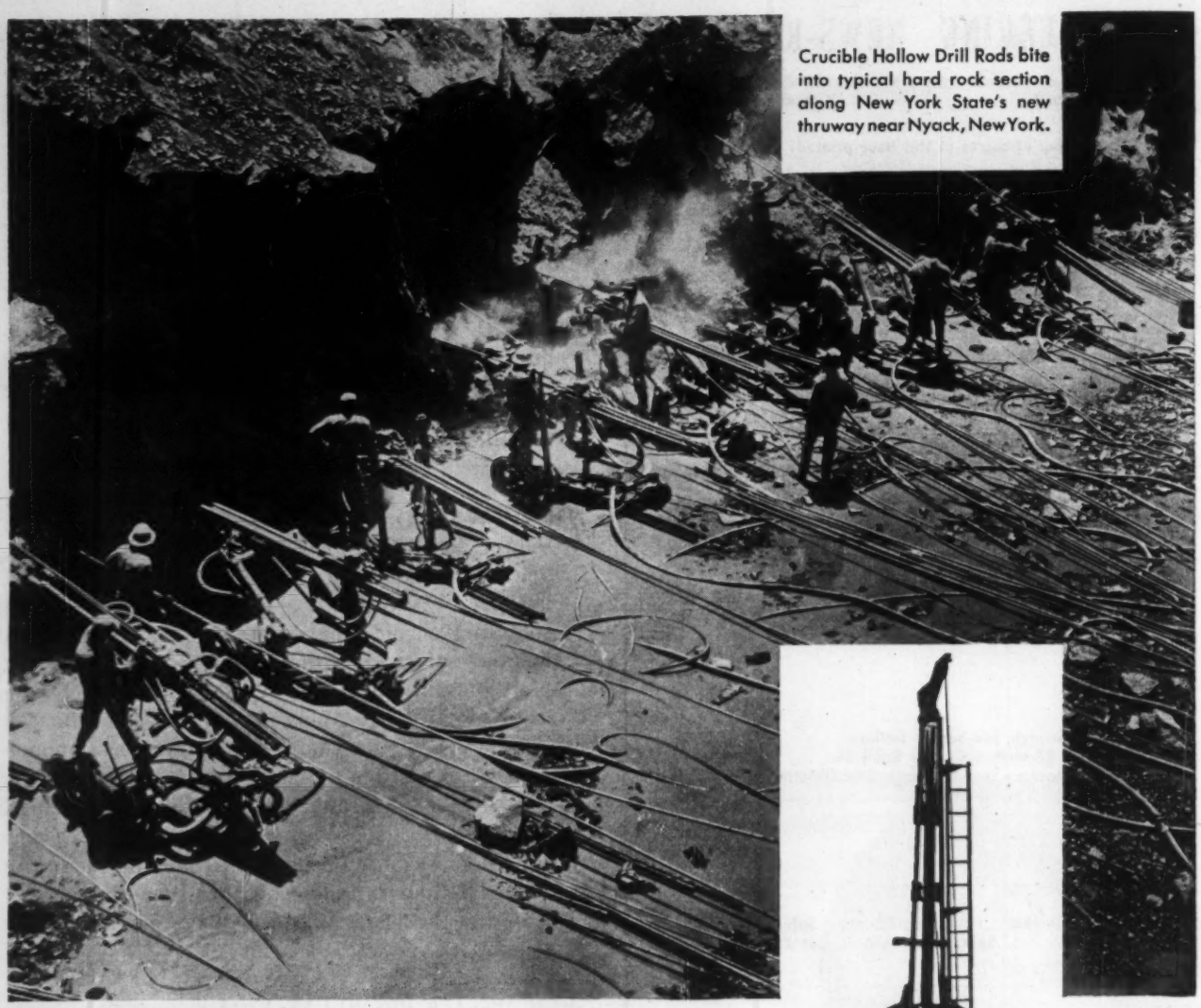
ENGINEER LICENSING—Despite influential opposition, members of the New York State Society of Professional Engineers have voted to push amendments to the state's engineer licensing law this year (ENR Dec 23, 1954, p. 11). The vote favors amendments to allow engineering practice by corporations other than those practicing since 1935 under a grandfather clause. However, amendments would require registration of any engineering corporation desiring to practice, plus licensing as professional engineers its entire board of directors and all other employes designated as engineers.

HERE WE GO AGAIN—The Incodel Plan, a four-state, $500-million Delaware River water supply scheme, was declared dead a year ago. And, just last week ENR carried a discussion (page 35) by a consulting engineer and an attorney for Pennsylvania, pointing out why they think it is better off dead. But, now comes a report that Pennsylvania's new Democratic Gov. George M. Leader will have the Incodel Plan re-appraised. Conflicting professional opinion on the proposed interstate accord vs existing U.S. Supreme Court jurisdiction isn't likely to change. However, with New York State and New Jersey now also under Democratic administrations and the fourth state, Delaware, a willing partner from the start, it looks like this hardy perennial issue is due for another round.

ELIGIBILITY PROBLEM—Virtually no North Dakota contractor has a chance of serving in his state legislature, unless the current session amends a law that bars persons doing $10,000 or more business with the state or any of its subdivisions. One of three contractors now holding seats has challenged the measure unsuccessfully up to the State Supreme Court.

WINDFALL REFUNDS—Uncle Sam stands a chance of getting back at least part of the windfall profits reaped under the Section 608 postwar apartment building program. An FHA official last week told a House Appropriations Subcommittee that tentative settlements had been made with four builders for refunds totaling $1 million. He expressed confidence that FHA would be able to recapture a fair sum, if it moves fast enough.

SIDE ISSUE—When asking for bids on a five-mile stretch of toll road near the towns of Charlton and Sturbridge in central Massachusetts, the state's turnpike authority asked that the contractor alert his men to watch for Indian relics. The route cuts across the battleground of the 1665 Podunk Indian war against King Philip.



Crucible Hollow Drill Rods bite into typical hard rock section along New York State's new thruway near Nyack, New York.

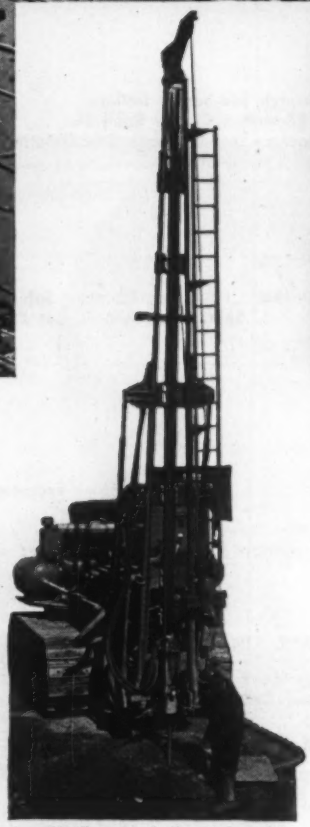
CRUCIBLE HOLLOW DRILL RODS

on the firing line —New York State Thruway

Chewing through hard rock sections of the New York Thruway, Crucible Hollow Drill Rods are helping to build this modern, high-speed highway across the state.

To make this motorist's dream come true meant careful planning by highway engineers—cooperation of dozens of contractors—top quality equipment. That's why large quantities of Crucible Hollow Drill Rods are being used. For experienced construction men *know* they can always depend upon Crucible Hollow Drill Rods for uniformly high performance in the field.

Crucible makes its hollow drill rods to *tool steel standards*. And that means *extra* quality . . . fewer broken rods and lost bits . . . *lowest cost per foot of hole drilled*. Make all *your* drilling jobs go smoothly—specify Crucible Hollow Drill Rods. *Crucible Steel Company of America, Henry W. Oliver Building, Pittsburgh 30, Pa.*



Joy Challenger drill and Crucible Hollow Drill Rod at work on New York State Thruway, Arden, N.Y.

CRUCIBLE first name in special purpose steels

Crucible Steel Company of America

WASHINGTON OBSERVER

Eisenhower's construction program is based on the long haul. He believes there's a real need for the federal government to do its share to keep the country's prosperity and employment up to its potential.

That's behind his new plans for stepped up spending on such things as highways, schools, urban redevelopment, flood control and reclamation starts (see pages 21, 22). There's more local participation, and other changes in procedure—but it adds up to a really big public works program.

Of course, there's good short-term politics in all this, too. Whether or not Eisenhower himself runs for his second term next year, he will have built a legislative program for the GOP to take to the voters.

•

There's no doubt that Eisenhower has turned the corner on spending. He is not talking up budget-balancing as one of the big objects in the years just ahead. Instead he talks about the growth of the country making it possible to finance projects that wouldn't otherwise be feasible. At the same time, he's holding off any tax cuts—saving them for such time as the economy might need a tax cut jolt.

•

There's grumbling from both Republicans and Democrats about those budget proposals that translate the Eisenhower middle-of-the-road program into dollars and cents.

Right-wing Republicans say that Eisenhower is too "New Dealish" but the realists among them know the party needs Ike when it goes to the polls next year. They can't repudiate him.

Democrats complain that he's lifted pages right out of their book. They know that his public works program is going to be hard for them to vote against. So they'll be forced to talk against the way Eisenhower does things.

•

The Democrats are ready to hit public power and federal works policies that Eisenhower is trying to put across. These challenges to the Administration will rank in importance with the debate over the new highway financing scheme of the Clay committee (see page 23).

•

The Dixon-Yates controversy will be a major target. Local "partnership" programs of dam building and electricity transmission will be gone over, too.

A pro-public power group is being organized in the powerful House Appropriations Committee to take on the Administration. Chairman Clarence Cannon of Missouri has set up a new subcommittee, called the Subcommittee on Public Works, to pass on the money requests of the major agencies dealing in federal construction. Under the new group will be: Corps of Engineers rivers and harbors projects, Atomic Energy Commission, Bureau of Reclamation, Bonneville Power Administration, Southeast Power Administration, Southwest Power Administration, and the Tennessee Valley Authority.

The nine Democrats appointed to this committee are predominantly pro-public power. The six Republicans who will go on it will be easily outvoted.

Money to AEC to buy the private Dixon-Yates steam plant can be cut off, right there. The same threat holds against federal contributions to some of the local power projects like Priest Rapids, etc.

This lineup assures a hard fight—which will mean delay in most of the appropriations legislation that the construction industry follows.

BORDEN MANUFACTURES EVERY TYPE FLOOR GRATING

IN FERROUS AND NON-FERROUS METALS

- **EASY TO INSTALL** — engineered in conveniently sized units for easy installation.
- **EXTRA STRONG** — reinforced, designed with maximum safety factor.
- **LIGHT WEIGHT** — approximately 80% open, reduces dead weight, allows greater live load.
- **SELF-CLEANING** — creates greater safety, economy of maintenance, no sweeping or washing required.

Write for complete information on BORDEN All/Weld, Pressure Locked, and Riveted Floor Gratings in this FREE 8-page catalog

BORDEN METAL PRODUCTS CO.

815 GREEN LANE ELizabeth 2-6410 ELIZABETH, N. J.
SOUTHERN PLANT—LEEDS, ALA. — MAIN PLANT—UNION, N. J.

BORDEN METAL PRODUCTS CO.

Gentlemen:

Please send me BORDEN Catalog

NAME .....

TITLE .....

COMPANY NAME .....

ST. AND NO. .....

CITY AND STATE .....

In the 1956 Budget:

Construction Funds Add Up to $5 Billion

President Eisenhower in his budget message to Congress this week called for a federal program in the fiscal year beginning next July 1 amounting to $5 billion—just a shade under the current level.

But this year, as never before, the budget figures fail to tell the whole story of government construction plans. Not included in the budget is the President's plan for doubling the rate of highway construction which he will present to Congress later this month.

Another omission is the Administration program for providing federal aid for school construction, slated to be the subject of a special message to Congress Feb. 15.

In addition, the Administration is planning for a substantial expansion of construction of government buildings under lease-purchase, of water and power projects in partnership with local interests and of urban renewal work—all at relatively low cost to the federal government.

Actually, there is more money than last year in the 1956 budget for almost every major construction agency of the federal government—with two important exceptions. The Tennessee Valley Authority gets only $79.9 million for 1956 as compared with $281.7 last year, and the Atomic Energy Commission gets $431 million compared with $823.3 last year (see table page 22).

But the Corps of Engineers, the Bureau of Reclamation, the Housing and Home Finance Agency and all three military services still have more money to spend in 1956 than they had in 1955—if Congress follows the recommendations of the President.

• **New starts**—President Eisenhower asked Congress to provide money to start 39 Army Engineer and reclamation projects that already have been authorized. In addition, he asked both authorization and cash for his two favored multi-purpose projects—upper Colorado and Fryingpan Arkansas. The President asked modest starting sums of $5 million for the $1-billion Upper Colorado development and $2 million for the $175-million Fryingpan project (see table page 26).

Among the previously authorized projects President Eisenhower recommended for starting, the largest is the $80-million job of widening the Calumet-Sag waterway in Illinois. Next biggest is the $77-million deepening of the Delaware River between Philadelphia and Trenton.

The "Sag" would get $4 million to start; the Delaware, $7 million—but only after U. S. Steel agrees to pay a share of the cost of a deeper channel for ore boats.

Of the other new starts requested, the most important is an urgent $47-million project to prevent the Mississippi River from changing its lower course completely, diverting its flow to the Atchafalaya River. Another is Eagle Gorge reservoir in the state of Washington, a $20-million flood control project that involves large local contributions.

Among presently authorized reclamation projects recommended for starting, the biggest is Santa Maria in California, estimated to cost about $17 million. Most other projects on the new starts list are considerably smaller.

Proposed partnership projects are more substantial. The President said he will ask Congress to appropriate money for the Army Engineers and the Reclamation Bureau—$10 million for each agency—to pay federal costs on cooperative projects like the three already in the works.

He expects local interests to install the power facilities at Cougar and Green Peter Dams in Oregon and to build the Rocky Reach project to Washington. The Corps of Engineers would construct the two Oregon dams and would pay the federal share of Rocky Reach costs to the developers of the site.

Investigations and planning for future projects would receive more money under the budget requests than they got this year. A total of $45 million is recommended for general basic data collection and $10 million for preliminary studies of river basin and other construction programs. Passamaquoddy Bay would be restudied as a potential power site under proposed legislation that will request $1 million for the work.

Advance preparation of construction plans would get a total of $13 million, of which $7 million would go for the design of high-priority projects by the Army Engineers and the Reclamation Bureau. The budget also requests $8.5 million for the Housing and Home Finance Agency to make public works planning advances to state and local governments.

• **Backlog is substantial**—At the start of the next fiscal year, July 1, federal agencies will have plans completed for $1 billion of authorized projects and advance planning in various stages of completion for an additional $3.4 billion.

A year later they expect to build up these totals to $1.9 billion and $3.7 billion. By that time, July 1, 1956, the Corps of Engineers will have plans completed for more than $850 million of work and in process for $2.2 billion. Reclamation will have complete plans for $300 million and planning under way for $900 million.

The total backlog of authorized federal projects amounts to $10.5 billion on the basis of present costs. Of this total, about $8 billion is in river basin programs of the Army Engineers and the Reclamation Bureau, which account for $5.9 billion and $2.1 billion, respectively.

In addition, these two agencies have programs and projects under construction with a total estimated cost of nearly $10 billion, of which more than $3.3 billion will remain to be completed after 1956.

As expected, no federal funds were requested in the budget message for the President's program to double the rate of highway construction. Financing of the federal share of the expanded program is to be assigned to a new independent federal corporation outside the budget. Federal highway aid to the states, however, goes up nearly $80 million above this year's figure to about $670 million.

Likewise, no school aid funds were asked by the President to carry out the "affirmative program" for more classrooms that he has promised. This omission makes it likely that the Eisenhower plan for assisting local governments to build more schools will not include any direct federal loans or grants.

Grants for school construction in

federally affected areas are scheduled to drop to $94 million in 1956 from $134 million this year.

But federal-aid grants for airport construction are expected to go up by more than $5 million—from about $14 million in the current fiscal year to $19.5 million in 1956.

Construction expenditures on the St. Lawrence Seaway also will increase in fiscal 1956. The St. Lawrence Seaway Development Corp. is spending $6 million this year. Next year it will spend nearly $22 million.

Grants for local hospital construction are slated to rise from $44 million this year to $55 million in 1956, of which $45 million will go to private nonprofit institutions. This program was expanded last year to include nursing homes, diagnostic centers and other facilities for the chronically ill.

Among new federal projects to be started in 1956 are three Veterans Administration hospitals—the long-awaited 1,000-bed hospitals at Cleveland and San Francisco and a 680-bed addition at Long Beach, Calif. Construction expenditures by VA will go up to $56 million from $40 million this year.

Other new projects to be started during 1956 include a $23-million building in Maryland for the Bureau of Old Age and Survivors Insurance; a $6.5-million medical research center containing a nuclear reactor at Brookhaven, N. Y., by the Atomic Energy Commission; and a new post office and courthouse at Nome, Alaska.

Planning and sites for lease-purchase buildings (to be built by private investors for federal occupancy) will require expenditures by the General Services Administration of about $3 million in 1956. Included will be $275,000 to complete the $350,000 planning job for a Geological Survey building.

Loans for the low-rent public housing in the year are expected to total nearly $500 million. About as much will be returned to the government in repayment of old loans. The 1956 budget provides for starting 35,000 units.

To assure no holdup in urban renewal grants to cities and towns, Eisenhower will ask Congress for $500 million of additional capital grant authority—$100 million for the current year and $200 million for each of the next two years.

• **Higher military construction**—Military public works expenditures of all three services will rise in 1956. Air Force spending will show the greatest increase, going up $170 million above the current year to more than $1 billion. In all, construction outlays by the Defense Department will amount to nearly $1.8 billion, an increase of $350 million over fiscal 1955.

Air Force construction in 1956 will expand the aircraft control and warning system and will build additional continental air defense bases. The Navy will further develop airfields for training and for jet aircraft and will construct shore facilities to serve the big aircraft carriers now being built. Army work will concentrate on completion of Nike facilities and new overseas troop bases.

Atomic energy construction spending tapers off to $430 million in 1956. Most of it will go into projects under construction, but new AEC projects proposed for next year include several prototype or developmental reactors and additional weapons storage facilities.

More Pulp Mills

MacMillan & Bloedel, Ltd., are planning two pulp mills on Vancouver Island. Total cost of the expansion will be $30 million. One mill will be for the production of newsprint and the other for kraft and containerboard.

H. A. Simons & Associates, of Vancouver, are going ahead with design work for the new facilities.

Construction Funds in 1956 Budget

Agency	1954 (Fiscal years. In millions) Actual	1955 Estimate	1956 Estimate
CIVIL WORKS			
Corps of Engineers	$399.8	$361.6	$397.0
Tennessee Valley Authority	299.3	281.7	79.9
Department of the Interior:			
Bureau of Reclamation	163.3	132.4	152.3
Bonneville Power Administration	41.7	36.1	32.0
Office of Territories	29.3	42.9	30.4
Other Interior	39.5	49.7	58.8
Saint Lawrence Seaway Development Corporation	....	6.0	21.6
Bureau of Public Roads	559.3	630.5	699.1
Housing and Home Finance Agency:			
Low-rent public housing:			
Loans	525.6	454.2	482.6
Defense housing and other (net)	30.8	8.9	3.4
Department of Health, Education, and Welfare	179.7	201.5	162.8
Veterans Administration	54.3	40.0	56.3
Department of Agriculture	70.4	65.7	42.4
National Advisory Committee for Aeronautics	39.7	21.0	16.0
Civil Aeronautics Administration	17.5	14.2	19.5
Department of State	11.8	5.9	7.3
Treasury Department (gross)	6.8	25.5	1.0
General Services Administration	9.7	21.8	24.6
Grants for private non-profit hospital construction	40.5	36.1	45.0
Rural Electrification Administration loans (gross)	210.0	210.0	210.0
College housing loans (gross)	34.9	40.8	28.2
Other	62.0	97.2	131.6
Total, civil public works	**2,825.9**	**2,785.7**	**2,711.8**
DEFENSE CONSTRUCTION			
Air Force	$1,711.7	$1,429.5	$1,782.3
Army	379.9	321.0	381.0
Navy	373.1	238.3	265.0
Interservice activities	....	13.0	13.0
Proposed legislation, Defense Dept.	....	....	95.0
Atomic Energy Commission	1,085.3	832.3	431.0
Proposed legislation, AEC	....	....	80.0
General Services Administration:			
Storage facilities	6.3	1.1	....
Total, defense construction	**2,803.3**	**2,262.9**	**2,293.3**
Total, federal construction	**5,629.2**	**5,048.6**	**5,005.1**

Highway Plan Draws Both Cheers, Criticism

The recommendations of President Eisenhower's special committee on highways won broad approval in Congress, among federal and state highway officials and in highway user groups this week. But there were barbed criticisms of specific details of the program.

The committee, under Gen. Lucius Clay, outlined ways to give concrete form to the President's suggestion that the rate of highway construction be doubled in the next 10 years. Committee recommendations are expected to form the basis of a special Presidential message to Congress on highways Jan. 27.

The committee said a total of $101 billion should be spent to bring the nation's highways up to standards for 1964 traffic, but it made specific proposals to cover only $72 billion of that total. The remaining $29 billion would come from the states.

A principal committee recommendation was that the federal government pay $25 billion of the estimated $27-billion cost of bringing the 40,000 mi interstate road system up to standard.

About $20 billion of the federal share, the committee said, should come from the sale of bonds issued by a federal highway corporation. The rest would come from federal taxes on gasoline and oil.

• **Critics in Congress**—In Congress, criticism of the committee recommendations centered principally on this scheme for financing the expanded highway building program.

Democrats led the attack, charging that the plan would create a "hidden debt" and would cost up to $1 billion more than straight budget financing. Sen. Albert Gore (D., Tenn.), the new chairman of the Public Roads Subcommittee, said, "This is a kind of financing Harry Hopkins never even dreamed of. It's a screwy plan which could lead the country into inflationary ruin."

Sen. Harry F. Byrd (D., Va.), chairman of the powerful Senate Finance Committee, was equally caustic in his criticism. He not only condemned the entire financing plan but also demanded the repeal of the current federal two-cent gasoline tax.

• **Criticism of highway officials**—Experienced highway officials attacked the Clay committee recommendations from a different angle. They centered their fire on the recommendation that decisions of the Commissioner of Public Roads should be subject to a veto by the five-man board of the federal highway corporation.

The committee said this board of directors should be composed of three citizens appointed by the President with the consent of the Senate and the Secretaries of the Treasury and of Commerce. The Secretary of Defense would sit in ex-officio when questions of highway location are considered.

The board would have the final word in determining which project should be built and in what priority on the interstate highway system. Heretofore, Commissioner of Public Roads has had full and final authority.

Highway officials believe the change suggested by the Clay committee will reduce the status of the Commissioner and will also serve as an invitation to play politics with the interstate highway program.

• **Criticism of highway users**—Highway user groups blasted the committee recommendations on still a third point. They hit at the suggestion that the federal government repay the states for construction on the interstate system that is up to standard—whether it be toll highway or free roads. Highway users charged this would amount to making their membership pay twice for the roads they use most.

The Clay committee—and the studies by the governors of the states, as well—recommended this refund to the states with a number of conditions:

• The money refunded would have to be used for other highway building.

• The state must have matched all normal federal-aid money allocated it.

• Credit for roads built between 1947 and 1951 should be limited to 40% of the costs, not including the cost of financing.

• Credit for roads completed prior to this year should be limited to 70% of the cost, not including financing costs.

• In no case should credit be given for federal funds expended on a road or for toll-road expenditures in excess of the amount remaining for amortization.

The Clay committee also made definite recommendations on a number of other aspects of the highway problem. It said:

• Federal funds should not be used for construction of off-street parking facilities or for the acquisition of land for such purposes.

• Since certain new urban arterials, not on the federal aid system, are necessary, $4 billion should be assigned for their construction during the 10-year period.

• Bonds issued by the federal highway corporation should be fully taxable.

The committee, headed by Gen. Lucius Clay, chairman of the board of Continental Can Co., also included Stephen D. Bechtel, San Francisco, president of Bechtel Corp.; David Beck, Seattle, president, International Brotherhood of Teamsters; S. Sloan Colt, New York, president, Bankers Trust Co.; and William A. Roberts, Milwaukee, president, Allis Chalmers Manufacturing Co.

THREE MEN who played leading roles in development of the highway plan get together at a White House conference. With President Eisenhower are Gov. Robert Kennon of Louisiana, who reported to the President on the plan for the Governors Conference, and Gen. Lucius Clay, who served as chairman of the President's special highway committee.

ARBA Examines Highway Plan

Road Builders' 53rd annual convention features materials exhibit; technical sessions cover wide range of problems

Discussion of President Eisenhower's "grand plan" for highways dominated the 53rd annual convention of the American Road Builders Assn. in New Orleans last week.

Louisiana's Governor Robert F. Kennon, chairman of the Governors Conference which studied the highway problem at the request of the President, keynoted the convention with the statement that even the $101-billion roadbuilding program now proposed might not be enough to provide highways fully adequate for traffic in 1964.

Gov. Kennon said the Eisenhower highway program would be of great benefit to the national economy but added that the program could, and perhaps should, amount to more than $101 billion. He recommended that all automobile taxes—an annual total of some $6 billion—should be applied exclusively to highways.

Although the highway program was the main topic both in the convention's general sessions and informal groups, other convention business also attracted attention.

This year for the first time ARBA put on a highway materials and supplies show, and it drew keen interest. The technical meetings during the four-day convention also played a more important part than they have in the past. In these meetings there were useful discussions on soils, maintenance of way, soil stabilization and materials.

The convention installed John N. Roberston, District of Columbia Director of Highways, as its new president replacing Robert M. Reindollar, Baltimore engineer consultant. Two new vice presidents also were elected: Charles W. Smith, president of Smith Engineering and Construction Co., Pensacola, Fla., for the Southern District, and George T. McCoy, chief engineer of the California Highway Department and president of the American Association of State Highway Officials, for the Western District.

The new ARBA president began with the District of Columbia Department of Highways in 1917 as a chainman in an engineering field party. In 1941 he was named Engineer of Streets, and in 1948 he became Director of Highways. Recently he launched a $125-million program of improvements for the capital.

Robertson also is president of the Association of Highway Officials of the North Atlantic States and is a member of the American Association of State Highway Officials, the Washington Society of Engineers and the Highway Research Board.

Speakers at the general sessions of the convention included Representatives J. Harry McGregor (R., Ohio); Jesse P. Wolcott (R., Mich.); George H. Fallon (D., Md.); and Senator Francis Case (R., S. D.).

Jennings Randolph, ARBA treasurer, spoke for outgoing president Reindollar, who was unable to attend because of illness. He singled out right-of-way acquisition as a major problem and recommended the creation of short university courses to give special training in proper cost evaluation with particular reference to severance damages.

Randolph also stressed the pressing need for an upward adjustment of state highway engineer salaries to boost morale, attract young engineers into the highway field and assure maximum efficiency.

Rep. McGregor cited the need to modernize a large number of state highway enabling laws, especially those controlling right-of-way acquisition. He also urged the extension of competitive bidding for highway jobs to replace force account road construction.

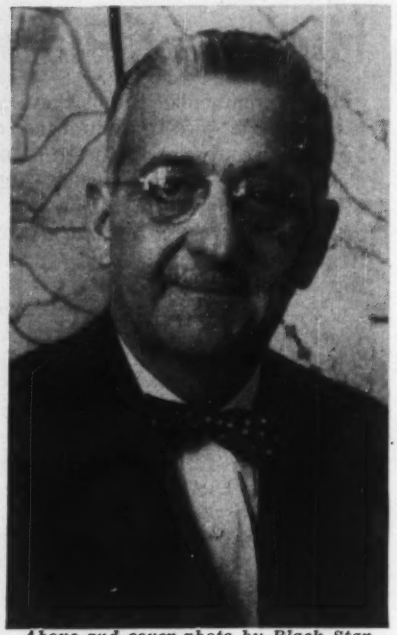
• **Highways and the national economy**—Rep. Wolcott, ranking minority member of the House Committee on Banking and Currency, said his committee had found inadequate highways a bottleneck to continued expansion of the national economy.

He said bonds issued by a federal highway agency would sell readily in the open market at rates only ⅛% higher than government bonds for long-term issues and ¼% higher for short-term issues.

Rep. Fallon stressed the importance of improved, modern highways in reducing fatal accidents, and H. E. Bailey, general manager of the Oklahoma Turnpike Authority, cited the record of the Oklahoma Turnpike to show a substantial reduction in fatal accidents.

Sen. Case warned that stepped-up construction on the interstate highway system must not delay or interfere with the building of badly needed primary, secondary and urban highways.

• **Soils session**—Two papers were presented on embankments and soils.



Above and cover photo by Black Star—Phillips

JOHN N. ROBERTSON becomes new president of ARBA.

James P. Exum, of the New York consulting engineer firm of Howard, Needles, Tammen & Bergendoff, described some unusual foundation problems on the Maine Turnpike extension.

He said in the particular marine clays near Portland neither vertical sand drains nor sheet pile cofferdams were feasible economically, but without some form of stabilization the clays could not support embankments for bridge approaches of more than 15 ft. He said the solution lay in "toe loading" the embankments with a heavy berm of soil along the shear area where foundation failure would occur first.

J. F. Tribble, assistant construction engineer of the Alabama State Highway Department, outlined techniques for building embankments across marshy areas. He discussed "floating" an embankment when muck depth is low, dredging and refilling in deeper muck and through unimproved areas, blasting under a rolling surcharge of sand, and sand drains.

• **Base Aggregates**—Base stabilization using asphalt emulsion with heated aggregates was the subject of a paper by L. C. Fitts, materials engineer of the New York Department of Public Works. At a total cost of $1.25 per sq yd, he said, two 24-ft-wide pavements on Long Island were paved with 5 in. of calcium chloride stabilized sub-base, 7 in. of bituminous stabilized base course and a 1-in. bituminous concrete wearing course.

The base course consisted of sand, gravel and loam which was passed through a dryer after blending with a

bulldozer and heated to 180 F. The amount of moisture in the material was held to 6%. Asphalt emulsion was added in a pug mill. The moisture content was such that work could proceed in inclement weather when most mixed-in-place work would have had to be suspended.

A. D. January, senior resident engineer of the Texas State Highway Department, described a soil-cement widening job on an old concrete pavement which proceeded at the rate of 2 mi a day. He said a 6-in. strip of soil cement was laid on top of an 8-in. sub-base for a total cost on the 14-in. depth of $5,410 a mile. The old 18-ft pavement then was widened to 24 ft and surfaced with a 250-lb hot asphalt mix.

C. W. McCaughey, deputy operations director of the Ohio Highway Department, told the convention that more state highway maintenance work is being done by contract every year. He reported on the methods and procedures Ohio has used in this field.

H. A. Radzikowski, Bureau of Public Roads, pointed out the advantages of maintenance by contract and said BPR has completed two years of study of the subject. He urged the delegates to send BPR any information on maintenance by contract that might come to their attention.

Mayor de Lesseps S. Morrison of New Orleans, in a welcoming address, cited the role of cities in the overall highway picture and explained New Orleans' huge Union Station plan which has revamped the whole transportation system of the city.

Consulting Engineer Sets Up Foundation To Aid Students

D. B. Steinman, well known bridge engineer, and his family have established the David B. Steinman Foundation, Inc., to help deserving students complete engineering studies or pursue full-time graduate work in engineering.

In announcing the Foundation, Dr. Steinman called it an expression of his gratitude for financial aid he received in the form of scholarships and fellowships during his college years.

The first disbursement by the Foundation was made last month to the Board of Higher Education of the City of New York. Amounting to $10,000, it will be used for loans or grants to students in the School of Technology of City College who may need financial assistance to complete their course or to undertake graduate study. According to the Board of Higher Education, the loans or grants will range from $100 to $500, with the loans being interest-free and unsecured.

School Aid Law Is Good Bet

Congress is expected to approve legislation this session providing federal aid for badly needed school construction

Congress is almost sure to vote substantial federal aid for school construction this year. That became obvious even before the congressional committees that will handle the legislation had completed their make-up.

President Eisenhower will trigger congressional action on school construction in a special message to Congress Feb. 15. But what, exactly, he will ask and what Congress will agree to are still unanswered questions.

The Administration's most budget-conscious officials favor an approach that would avoid charging the budget with federal expenditures for schools. They want the federal government to adopt a guaranteed loan technique.

Congressmen close to the issue say Congress will never buy this. They point out that many school districts already have exhausted their borrowing power and so would be unable to take advantage of this sort of federal aid. Many of these school districts, too, are in areas where the shortage of classrooms is greatest.

Some other Administration officials and a large number in Congress want the school aid program to take the form of federal grants-in-aid to the states. This would create a budget problem, but it would enable Congress to keep a finger in this politically important piece of pie.

• **Long-range or short-term?**—Another struggle shaping up in Congress, on the basis of bills so far introduced, is whether to approve a long-range program geared to provide between $10 billion and $12 billion in federal aid over a 10-year period or to settle for a short-range approach at a level of between $250 million to $500 million a year for two or three years.

The short-range approach may have the better chance because of the opposition of economy-minded congressmen to launching the government in a big new field of spending.

The President's message is expected to touch off a race between the Senate and House Labor Committees to see which can get out a bill first. The legislation is likely to be known by the name of the congressman whose bill first is approved by one of the chambers.

Sen. Lister Hill of Alabama has introduced a Senate bill with a score of co-sponsors and will get his name on the bill if the Senate acts first. There are three bills before the House Education and Labor Committee. House members expect their bill to be a committee composite, and there is a good chance it will bear the name of the chairman, Rep. Graham Barden of North Carolina.

Rep. Barden is the key to House action. He is a southern conservative and states-righter and has long opposed federal "intervention." But he supported legislation providing federal school aid to areas impacted by federal activity—defense and military.

He also is rated one of the best informed congressmen on education and is known to feel strongly the need for outside aid to the states in meeting the schoolroom shortage.

Both Rep. Barden and Rep. Samuel McConnell, ranking Republican member of the committee, are expected to support federal aid legislation.

• **Apportionment and administration**—A study made by a subcommittee last session estimated the cost of building adequate school facilities at between $10 billion and $12 billion. Rep. Carroll Kearns, Republican of Pennsylvania, chairman of this subcommittee, has introduced HR 14 which would authorize Congress to match funds that the states are willing to put up on a dollar-for-dollar basis.

This would provide no formula for apportionment and would leave administration of the program up to each state under its chief school officer.

Most House committee members are likely to try to skirt the segregation and parochial issues implicit in the question of federal aid. They feel they can bypass these thorny issues by placing the administration at the state level in the hands of the chief school officer of the state.

These issues are more apt to be raised in the Senate. Senators who support a strong civil rights program are sure to try to write in provisions calling for compliance with the Supreme Court segregation decision as a prerequisite to getting aid. But because the school shortage problem is so general, the civil righters are not likely to jeopardize the legislation with a filibuster.

Some see the business of apportioning the funds to the states as the greatest obstacle to passage of the legislation. Sen. Hill's bill calls for $500 million a year for two years, with an apportionment formula that would favor the poorer states. Congressmen from northern states are almost sure to object to this approach.

Tunnel Triumph

Bore completed on 6.4-mi Tecolote job, after fight against hot groundwater

The hottest tunnel in recent construction history—the 6.4-mi Tecolote Tunnel through the Santa Ynez Mountains of California—was holed through Jan. 15. The final blast took out an 8-ft-thick plug 1,900 ft from the outlet portal at the head of Glen Anne Canyon, 20 mi northeast of Santa Barbara.

The job was started in May 1950, but completion of the bore was delayed for months when several hundred feet of hot rock and steaming water were encountered (ENR June 17, 1954, p. 45.)

The $43.8-million circular tunnel is part of a Bureau of Reclamation project to bring water from recently completed Cachuma reservoir on the Santa Ynez River through the mountains for irrigation and domestic use in the Santa Barbara area.

The tunnel, 7 ft in dia, is capable of delivering 30,000 acre-ft of water a day at a capacity rate of 100 cfs. The water will be delivered to regulating reservoirs already constructed at Glen Anne, Lauro Ortega and Carpinteria. Forty percent of the flow will be piped into Santa Barbara's city reservoirs to meet continuing threats of water shortage in dry seasons.

Completion of the tunnel work is expected by the end of the year. This will permit delivery of the much-needed water many months earlier than had been anticipated—a five-year extension of the tunnel job was thought to be a conservative guess when crews struck hot water.

It was in the summer of 1953 that the tunnel job ran into difficulties. Nearly 4,000 gal of water a minute at a temperature of 112 deg poured out of the fractured rock. It became impossible to work in the hot and humid bore.

A million dollars worth of air-conditioning equipment was installed at the head of the tunnel in a room hollowed out in the heart of the mountain. Pumps were put in to evacuate the hot water and a new power cable was run into the tunnel to supply power to operate all the equipment.

Another Cement Plant in Ohio

The Peerless Cement Corp. of Detroit, plans to build a new plant in the Detroit area that will have an annual capacity of 1,000,000 bbl. Peerless already has increased its capacity 95% since World War II.

New Water Resources Projects and Resumptions

Agency and project	Total estimated cost	Money requested for 1956
Navigation		
CORPS OF ENGINEERS		
Mobile Harbor, Ala.	$3,446,000	$1,000,000
Tampa Harbor, Fla.	4,434,000	977,000
Indiana Harbor, Ind.	45,000	45,000
Calumet-Sag Waterway, Ill.	80,238,000	4,000,000
Green River Channel Improvement, Ky.	3,434,000	2,275,000
Mystic River, Mass.	4,500,000	500,000
St. Marys River, Mich.	3,312,000	338,000
Portsmouth Harbor, N. H.	952,000	400,000
Staten Island Rapid Transit Bridge, N. Y.	7,654,000	1,000,000
Delaware R. Phila. to Trenton, Pa., N. J. (specific recommendations to be sent to Congress only on basis that provision be made for adequate cost sharing in some form)	77,100,000	6,000,000
Delaware R. Phila. to sea (Mantua Creek) Pa.	1,600,000	1,000,000
Charleston Harbor, S. C.	200,000	200,000
Corpus Christi Bridge, Tex.	3,590,000	1,500,000
Norfolk Belt Line Bridge, Va.	2,302,000	800,000
Subtotal, 14 projects	**192,807,000**	**20,035,000**
Houston Ship Channel, Tex. (resumption)	3,650,000	500,000
Subtotal, 14 projects and 1 resumption	**196,457,000**	**20,535,000**
Local flood protection		
San Antonio and Chino Creeks, Calif.	12,000,000	700,000
Folly Brook unit, Conn.	263,000	263,000
Portneuf River and March Creek, Idaho	500,000	500,000
Jackson, Ky.	260,000	246,000
Cape Girardeau, Mo.	4,450,000	750,000
Carthage, Mo.	383,000	367,000
East Poplar Bluff and Poplar Bluff, Mo.	354,000	314,000
Wellsville, N. Y.	960,000	350,000
Bradford, Pa.	8,100,000	500,000
Greybull, Wyo.	743,000	300,000
Subtotal, 14 projects and 1 resumption	**196,457,000**	**20,535,000**
North Adams, Mass. (resumption)	14,517,000	750,000
Subtotal, 10 projects and 1 resumption	**42,620,000**	**5,040,000**
Flood Control		
Old River control, La.	46,750,000	2,250,000
Eagle Gorge Reservoir, Wash.	20,500,000	1,000,000
Subtotal, 2 projects	**67,250,000**	**3,250,000**
Beach erosion control		
Hammonasset, Conn.	167,000	167,000
Winthrop Beach, Mass.	340,000	210,000
Hampton Beach, N. H.	140,000	140,000
Atlantic City, N. J.	2,044,000	906,000
Cold Spring Inlet, N. J.	260,000	60,000
Ocean City, N. J.	105,000	67,000
Presque Isle Peninsula, Pa.	2,006,000	600,000
Virginia Beach, Va.	560,000	235,000
Total, 8 projects	**5,622,100**	**2,385,000**
Total, 34 projects and 2 resumptions	**311,949,000**	**31,210,000**
Small projects costing less than $150,000[1]	**2,000,000**	**2,000,000**
Total, Corps of Engineers	**313,949,000**	**33,210,000**
BUREAU OF RECLAMATION		
Irrigation and water supply		
Palo Verde, Ariz.-Calif.	6,889,000	1,985,000
Santa Maria, Calif.	16,690,000	1,000,000
Michaud Flats, Idaho	3,955,000	520,000
Deschutes Haystack Equalizing Reservoir, Ore.	1,600,000	250,000
Chief Joseph Dam, Foster Creek Div., Wash.	4,346,000	631,000
Total, 5 projects, Bureau of Relamation	**33,480,000**	**4,386,000**
Total, authorized: 39 projects and 2 resumptions	**347,429,000**	**37,596,000**

[1] Navigation and local flood protection projects to be selected by the Army Secretary.

Jobs in the News

TRANSFORMER PLANT—General Electric Co. will build a highly mechanized plant in the Hickory-Newton-Conover area of North Carolina for the manufacture of pole-type distribution transformers. The plant will be a 400,000 sq-ft, one-story building fronted by an air-conditioned office building. Estimated cost is $20 million. Robert & Co., Inc., Atlanta, Ga., is architect-engineer.

SHOPPING CENTER—George A. Fuller Co., New York and Chicago, has been selected as chief contractor for construction of a shopping center in Milwaukee. The center, known as Capitol Court, will be built on a 65-acre site and is scheduled for completion in 1956. Estimated total cost is $15 million. Ed Schuster & Co., Milwaukee, is the developer.

AMMONIA PLANT—Girdler Co., Louisville, Ky., has received a contract for construction of an anhydrous ammonia plant for fertilizer at Searsport, Me., for Northern Chemical Industries, Inc. Estimated cost is $9 million.

HOUSING DEVELOPMENTS—M. A. Mace, Fairfax, Va., will construct with own forces a $7-million residential development at Fairfax; Harry Ormston, McLean, Va., is architect. In Babylon, N. Y., Deer Park Homes, Inc., Babylon, will build a $7-million housing development with own forces; Alwin Cassens, Jr., Valley Stream, N. Y., is architect.

Engineers Selected To Plan Mississippi Bridge Approach

The Louisiana Highway Department has selected three engineering firms to prepare plans and specifications for the east bank approaches of the new Mississippi River bridge at New Orleans. (ENR Oct. 21, 1954, p. 22).

The firms are Knappen-Tippets-Abbett-McCarthy of New York, Hardesty and Hanover of New York, and David W. Godat and Associates of New Orleans.

The consulting engineers will have until Jan. 1, 1956, to complete plans for the 8,100-ft bridge approach, a high-level structure that will cost about $15 million. The engineering fee will be 2⅞% of total construction cost.

The state highway department will handle construction supervision of the project.

The bridge approach will run into the projected Pontchartrain Expressway, extending across New Orleans to Lake Pontechartrain. The highway department will let contracts this month for construction of the first stages of the Carrollton Interchange—a $7 million to $9 million structure—which will be located on the Pontchartrain Expressway.

Bids also will be opened later this month for construction of the bridge's four piers, estimated to cost $12 million.

Construction of the bridge proper is the responsibility of the Mississippi River Bridge Authority.

Robert H. Saunders Dies; Ontario Hydro Chairman

Robert H. Saunders, 51, chairman of the Hydro-Electric Power Commission of Ontario, died Sunday in London, Ont.

His death came as the result of injuries received in the crash of a company plane on Jan. 15.

Saunders, who headed the $1.5-billion public utility during its greatest period of expansion, has been credited with having had a lot to do in making the St. Lawrence Seaway and Power Project a reality.

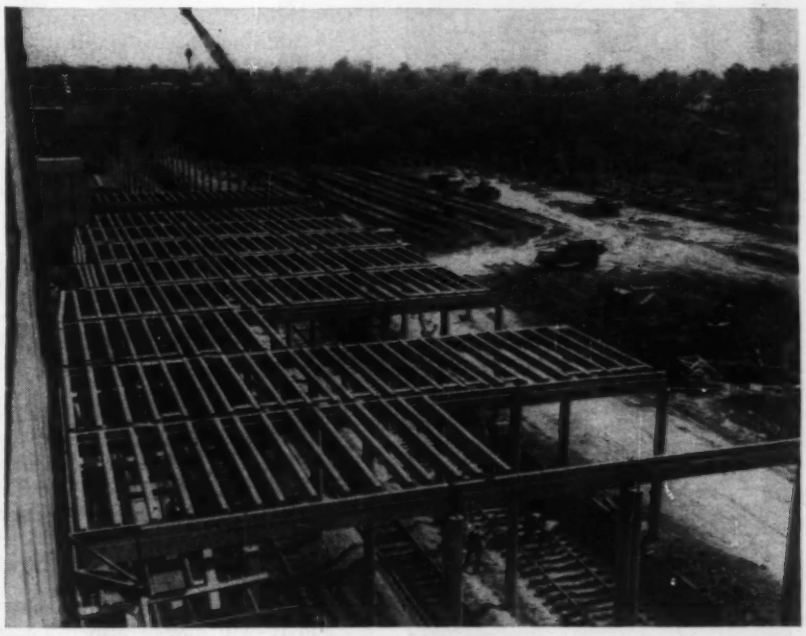
Louisiana Legislature Votes $50 Million for Highways

The Louisiana legislature at a special session appropriated $50 million for use on the state's highways.

Two bills, the only business of the emergency session, were passed by the legislature and signed by Gov. Robert F. Kennon. One provided $30 million for farm-to-market roads; the other, $20 million to match federal funds for urban, primary and secondary roads.

Gov. Kennon called the $50-million program an interim program until a long-range plan based on an Automotive Safety Foundation study can be presented at the regular session of the legislature in May. At the same time, a 16-member joint legislative committee has been appointed to draft legislation for the long-haul program. A recent proposal for using part of the state's oil income to finance a $500-million program probably will figure in legislative deliberations.

Although no decision has been made as to the size of this forthcoming program, Gov. Kennon has stated that a 10-year, $1-billion program is likely. This estimate takes in possible federal funds.

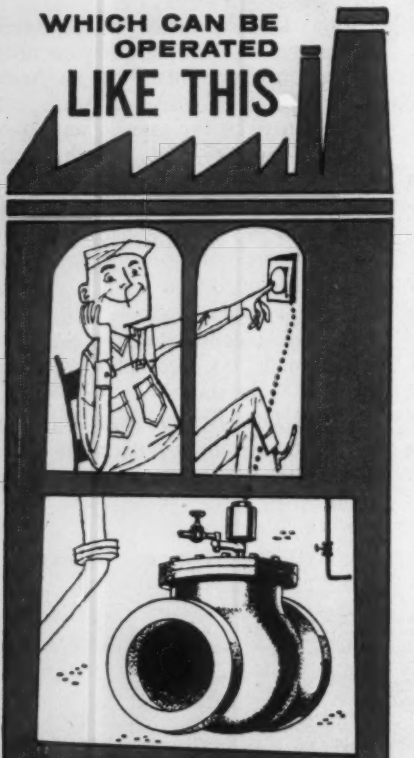


Concrete Blocks Form Factory Framing

Prestressed joists and girders made of concrete blocks support the floors and roof of a 250,000-sq ft addition to the Nashville plant of the Bendix Division of the Crosley Corp.

Designed by Ross H. Bryant, Nashville consulting engineer, the 24-in. block girders span 20 ft and can support 250-psf floor loads. They were made continuous over the columns by the later incorporation of negative reinforcing in cast-in-place topping. Block joists similarly were made continuous. These members support concrete filler blocks between them. In some sections of the building, however, 10-in. channel slabs with a 2-in. topping slab were used instead of the joists. Spencer J. Warwick & Associates, is the architect, and R. C. Mathews, the contractor. Both are of Nashville.

modernize
YOUR PLANT WITH
G-A
SOLENOID
VALVES
WHICH CAN BE OPERATED
LIKE THIS



√ or by many other types of electrical impulse
√ Use the angle body and save the price of an elbow fitting
√ Positive Control
√ Sizes ½" thru 36"
√ Used on Water, Oil, Air and Many Other Liquids

BULLETIN W-7 HAS THE TECHNICAL FACTS
WRITE FOR IT TODAY

GOLDEN ANDERSON
Valve Specialty Company
1208 RIDGE AVE., PITTSBURGH 33, PA.
Designers and Manufacturers of
VALVES FOR AUTOMATION

New York Plans Bridges on Grand Scale

World's largest suspension bridge tops list of three toll projects to be built for city at a cost of $379 million

The world's largest suspension bridge is one of three toll bridge projects totaling $379 million which the Port of New York Authority and its sister agency, the Triborough Bridge and Tunnel Authority, are prepared to undertake at an early date.

Part of a master plan for improving the arterial highway connections of Greater New York City, the bridge projects would require road links costing another $198 million. State and federal aid would figure in the highway aspects of the plan.

The New York City authorities' toll bridge projects—based on a joint study started last February (ENR Feb. 18, 1954, p. 43)—will require approval of the New York State legislature and in one instance of New Jersey. Prompt legislative action is expected by officials of the two authorities.

The three bridge projects proposed by the two New York City authorities:

• A $204-million suspension bridge, the world's largest, across The Narrows of Upper New York Bay, connecting Fort Hamilton in Brooklyn with Fort Wadsworth, Staten Island.

• Addition of a six-lane lower deck on the George Washington Bridge costing $82 million. This famous bridge connects the northern areas of Manhattan with Bergen County, N. J.

• A $93-million, six-lane, single-deck suspension bridge over Long Island Sound, connecting Cryders Point in the borough of Queens on Long Island to the Fort Schuyler section of the borough of Bronx. The site lies between the existing Triborough Bridge and the Bronx-Whitestone Bridge.

• **The Narrows Bridge**—Although The Narrows Bridge will be built as a two-level structure, only the six-lane lower deck will be used until traffic requires opening the upper deck. Approaches and ramps for the upper deck will require expenditure of another $16 million eventually.

The bridge—anchorage to anchorage 7,200 ft—will have a suspension span of 4,400 ft, 200 ft longer than the Golden Gate Bridge in San Francisco and 900 ft longer than the center span of the George Washington Bridge up the Hudson River from the proposed site. Bridge towers will be 700 ft high, clearance at mid-span above mean high water will be 237 ft.

The facility will provide northerly connections via the Brooklyn-Battery Tunnel with Manhattan and also with the Brooklyn-Queens Expressway leading to Long Island, Westchester County and New England.

Staten Island approaches are designed to provide a southern bypass route for through traffic around New York City midtown areas as well as to Staten Island give its only direct vehicular connection with the city.

The Triborough Authority has a federal government permit for the construction of a bridge across The Narrows. Financing arrangements will be instigated immediately after state legislative approval is given.

Under the plan, the Port Authority would finance and construct the bridge, then lease it to the Triborough Authority. Triborough would acquire ownership sometime prior to 1969.

• **George Washington Bridge**—A 75% increase in the existing hourly capacity of the George Washington Bridge is sought by construction of the six-lane lower level.

Since the bridge originally was designed to accommodate a lower deck, this can be built in about two and one-half years for about $20 million.

Approximately $62 million will be spent modifying structures providing interchange with the Henry Hudson Parkway and Riverside Drive, in modification of existing approaches to the local Washington Heights area and construction of an eight-lane, open-cut, East-West Expressway that would connect the bridge with the Cross-Bronx Expressway now under construction across the Harlem River from Manhattan.

• **The Throgs Neck Bridge**—Third major structure represented in the plan is a 5,200-ft, six-lane suspension bridge that would connect Long Island with the Bronx paralleling existing Triborough and Bronx-White-Stone Bridges. This $93-million structure will be a 3½-year job.

• **Connecting highways**—More than $198 million in state and federal funds must be spent on outlying arteries.

Brooklyn connections with The Narrows Bridge would cost an estimated $39 million, while those for Staten Island would cost at least $35 million.

More than $60 million would be spent on an East-West Expressway connection with the western end of the George Washington Bridge in Bergen County, N. J.

an ACCO product

American Cable "Green Strand" Wire Rope

What Wire Rope Do You Use on Your Carrier Scrapers?

• A complete description of a scraper cable is as long as your arm. But all you have to remember, if you are buying American Cable, is simply: TRU-LAY Streamlined Scraper Cable. And here's what you get, and why—

6 x 25 Flattened Strand—This means six strands of twenty-five wires each wound around triangularly shaped wires in the center of each strand. One flat side of the center wires of each strand faces out providing a relatively flat surface on the strand. The outsides of the six strands together make a smoother surface which gives the rope a much better bearing area against small sheaves and drums.

Independent Wire Rope Core—This adds considerably to the rope's breaking strength, and provides a solid steel core which keeps the rope from pulling down or flattening out on the small sheaves of a carrier scraper.

Lang Lay—When the wires in the strands are laid in the same cross-direction as the strands in the rope, the rope is Lang Lay. This makes the rope last longer because more of the outside wires are exposed to wear. It also makes the rope withstand more bending because of the helix of the wires. The crankiness of Lang Lay is removed by American Cable by preforming.

TRU-LAY Preformed—American Cable's Streamlined Scraper Cable is preformed to make it handle easier and last longer in bending around small sheaves. When wires do break, they stay in place instead of barbing out to slice hands and snag clothing.

Improved Plow Steel—That's what TRU-LAY Preformed is made of. The wire in this all-steel wire rope has an average tensile strength of 260,000 pounds per square inch. Look for the *green strand* which identifies this strong wire rope.

Just ask for TRU-LAY Streamlined Scraper Cable next time and every time you need rope for your carrier scrapers. You can also use it for the blade rope on your bulldozers. Your American Cable distributor stocks it and can give you quick service. Call him today or write our Wilkes-Barre, Pa., office for further information.

ACCO

TRADE MARK

American Cable Division
AMERICAN CHAIN & CABLE

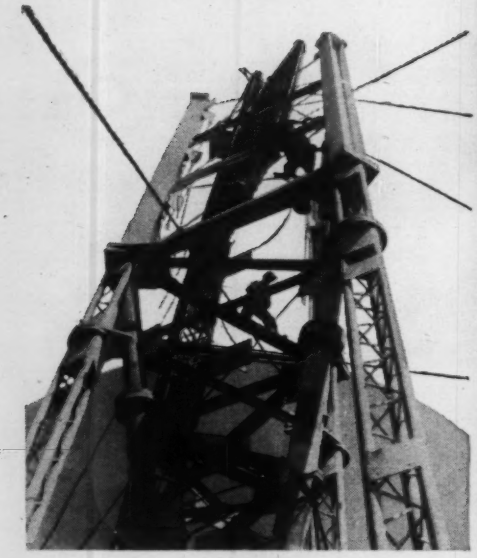
Wilkes-Barre, Pa., Atlanta, Chicago, Denver, Houston, Los Angeles, New York, Odessa, Tex., Philadelphia, Pittsburgh, Portland, Ore., San Francisco, Bridgeport, Conn.

plus ACCO Registered Wire Rope Slings

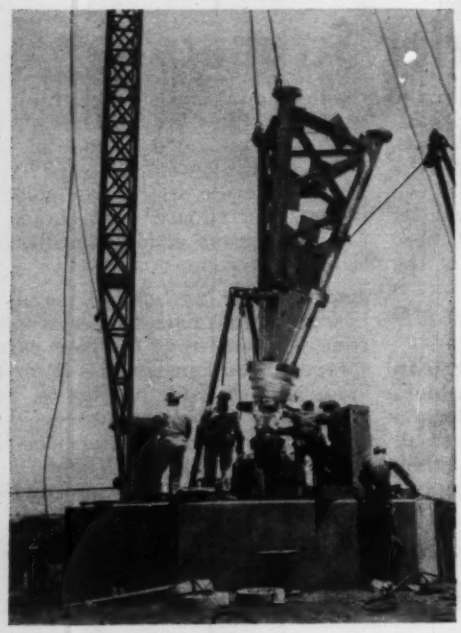
On the world's tallest

1572 FT.

STATION KWTV OKLAHOMA CITY



Here the self-raising, traveling gin pole is being positioned inside the first tower bay. With this unique rig the complete erection was accomplished in nine weeks, just half the time ordinarily required.



Erecting the forged steel base section of this record-breaking tower.

man-made structure...

USS MAN-TEN Steel

provides the needed combination of high strength with light weight

THE 1,572-foot television tower of Station KWTV in Oklahoma City dramatically illustrates the advantages obtainable with USS MAN-TEN High Strength Steel in structures where both great strength and light weight are imperative.

From this record-height tower which is 100 feet taller than the tip of the antenna atop the Empire State Building, the KWTV telecasts will cover an area of over 27,000 square miles.

The sheer magnitude of this structure posed its own problems. The hazards of wind pressure and ice formation added others equally difficult. The design engineers were faced with the job not only of raising a structure of breath-taking height but one that above the 780 foot level would resist winds up to more than 150 miles per hour.

For certain sections of the tower, they specified USS MAN-TEN steel —to obtain high strength with no increase in weight and to reduce weight without sacrificing strength.

USS MAN-TEN Steel was selected for the KWTV tower construction for these specific purposes:

—*To supply needed strength* to the intermediate sections where maximum diameter mild rolled steel rounds were simply not strong enough to carry the load of the tower above.

—*To save weight* in the topmost bays where mild steel although strong enough could be replaced by lighter sections of USS MAN-TEN Steel of equal or greater strength.

—*To reduce wind resistance* in the topmost bays, where smaller sections of USS MAN-TEN Steel provided the same strength as bulkier, heavier, mild steel sections.

CONSTRUCTION FACTS

This tower is triangular in section, 12 feet on a side. All structural members were shop welded. Field connections were made with galvanized structural ribbed bolts secured by galvanized locknuts.

The three legs of the tapered base, assembled on the ground in two parts, are forged steel rounds 10½ in. in diameter. Above the base, up to the 300 ft. level, the legs are vertical 14 in. 314# wide-flange mild steel beams. Next come two sections of 9½ in. mild steel rounds. Above that are 35 sections, each 30 ft. long, solid USS MAN-TEN steel rounds stepping down from 8 in. to 6 in.

For the next 60 ft. there are 4 and 5 in. mild steel rounds and, finally, on top, the antenna support framework is made up of 8x8x1⅛ in. MAN-TEN angles. The 30 ft. long sections were erected by means of an unique, electrically operated traveling gin pole especially designed for this job, and went up at a rate of 90 ft. per day to complete the frame erection in only nine weeks' time.

The structure was designed by R. A. Vaughan, chief engineer, Orville Falkey and James Walsh of the Dresser-Ideco Co., Columbus, Ohio. Ideco fabricated the steel and subcontracted erection to Mixell Construction Co., Ganado, Texas. Leonard Mixell, president of the subcontracting firm, designed the self-raising gin pole.

SOON TO BE ISSUED . . . Our new *"Design Manual for High Strength Steels"* contains comprehensive and practical information that you will find extremely useful in designing your products for greater economy and efficiency by the sound use of high strength steels. Watch our future advertisements for the announcement of the availability of this important publication.

See "THE UNITED STATES STEEL HOUR"—Televised alternate weeks—Consult your newspaper for time and station.

UNITED STATES STEEL CORPORATION, PITTSBURGH • AMERICAN STEEL & WIRE DIVISION, CLEVELAND • COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO
NATIONAL TUBE DIVISION, PITTSBURGH • TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA. • UNITED STATES STEEL SUPPLY DIVISION, WAREHOUSE DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

USS HIGH STRENGTH STEELS

USS MAN-TEN • USS COR-TEN • USS TRI-TEN

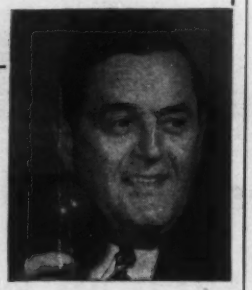
5-297

UNITED STATES STEEL

Darex Diary

by Henry L. Kennedy

Past President, American Concrete Institute
Mgr., Construction Products, Dewey & Almy Chem. Co.



* Examples of the savings to taxpayers brought about by air entrainment

* "Zero slump" concrete vs. plastic concrete

I WONDER if you have really considered how air entrainment has affected the economy aspects of construction . . . and how it helps the taxpayer. I think one of the outstanding examples is in the construction of mass concrete. Before the use of air entrained concrete, it was customary to use 4 sacks of cement per cubic yard for the interior of the dam structure. Now 2½ sacks of cement per cubic yard is not uncommon, and on a recent dam, more than ¼ million cubic yards of concrete were poured with 2 sacks per cubic yard. The job finished up at 2¼.

One of the engineers on a new dam in California told me that he had estimated savings of approximately $2,000,000 on that particular dam through the use of air entrainment. This came about not only through the use of a lower cement content, but also because of a decrease in the cost of the cooling mechanism (because of the lower cement content) and because they use less of the fine aggregate. In the case of the 2½ sack concrete, probably 19% sand would be used; whereas in the plain concrete using a 4 sacks/cubic yard mix, the sand content would be 28-30%. A saving is also realized in the vibrating equipment.

* * *

ON a recent trip overseas, I found wide use of what they term "zero slump" concrete. However, I like to term it "*minus* zero slump" concrete, for the reason that the water content often was reduced to an extent well below that at which zero slump would first occur. With the help of excessive vibration, it can be placed; and high compressive strengths are obtained. However, the concrete is not homogeneous and not as durable as a low-slump, plastic, air entrained concrete with a somewhat lower strength.

In one country, I was invited by the engineers to duplicate a 3" maximum size mix which they had just completed, and which required a total of 45 seconds vibration. They told me to use U. S. techniques. There happened to be some air entraining agent available, (a brand in which I have complete confidence!). I used it on the basis of 1 ounce/sack. Looking over the sand gradation, I noted a decided deficiency in the minus 30 mesh size, so I increased the percentage of this size about 5% and subtracted the same from the larger fractions. I increased the water four points.

After the usual amount of mixing, the material was, as is their custom, dumped out on the concrete floor. The remark was made, "but this mix is as dry as our own". I explained to them that the mix was no wetter, but that the matrix was a plastic mix and that when we screened out the 3-inch size, we would probably have a slump of 1 inch. I expected that the vibrating would be nearer 5 to 6 seconds than 45 seconds. When the slump was measured, it was just over 2 cm. and the vibrating time was 4 seconds.

I was delighted to hear not long ago that their concrete highway specifications had been changed to a 1 to 2" slump and 4% ± 1% air.

Here's a partial list of Dewey and Almy products for the cement and concrete industries

DAREX AEA — the world's leading brand of air entraining agent

DARALITE — air entraining agent for use with lightweight aggregates

DARACONE — extra-durable silicone water repellent

DARASEAL — premium quality concrete curing compound

DARAWELD — concrete bonding agent

GRINDING AIDS — for use in the manufacture of cement

DEWEY and ALMY CHEMICAL COMPANY
DIVISION OF W. R. GRACE & CO., Cambridge 40, Mass.
Offices or Subsidiaries in principal U. S. cities
and in Buenos Aires, Copenhagen, London, Melbourne, Milan, Montevideo, Montreal, Naples, Paris, São Paulo, Tokyo.

CITY BY CITY

Start of a Civic Center

New Orleans—Back in 1946 New Orleans started acquiring an 11-acre site on the fringe of the main business district for a civic center. This week city officials are getting set to award a $7,019,000 contract for construction of the center's first building—an 11-story city hall.

The successful bid for construction of the city hall—submitted by R. P Farnsworth & Co., Inc.—was lowest of eight received.

Multi-story wings on each side of the city hall will house a council chamber and a 700-car garage. The Farnsworth bid calls for construction of the city hall within 700 days after issuance of a work order, and the garage within 300 days.

Plans and specifications, supervision, landscaping and site development plus other contingencies will bring the project's total cost up to some $7.9 million. But $7 million in bonds already has been sold and the rest of the money will be raised from the sale of the old buildings and land vacated by the city government.

$100-Million City

Sterling, Mich.—Construction of a $100-million city in Sterling Township, 14 mi north of downtown Detroit, is expected to get under way sometime this spring.

Under the project—reportedly the largest real estate development in Michigan's history—a community of 30,000 will rise on an 8-mi square site, located in a rapidly expanding industrial area.

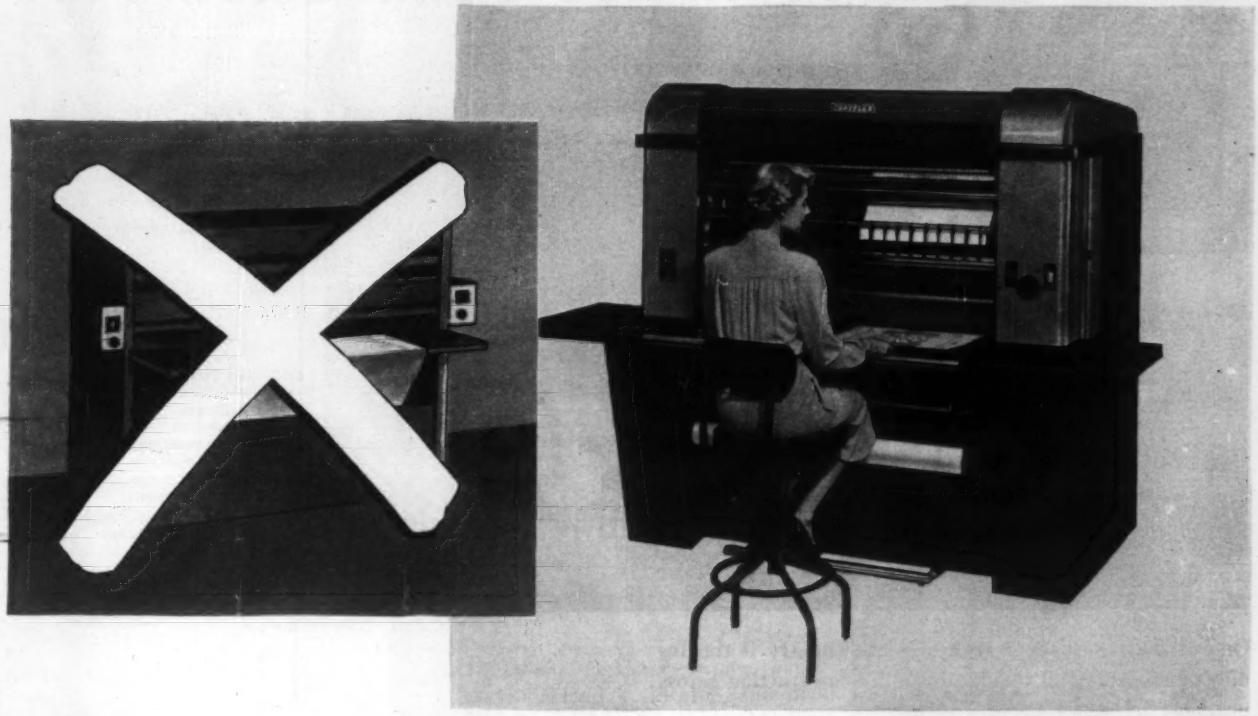
Plans call for approximately four schools, four churches and one shopping center for each square mile of the community. All-paved curvilinear streets will be 60 ft wide with 30-ft pavements. Lots will be 60 x 150 ft.

Real estate broker Carl R. Sams, developer of the present plan, claims to have enough backers to finance the entire project as well as definite commitments from more than 50 homebuilders.

Sterling Township officials have agreed to build a sewage disposal plant with a connecting trunk sewer on the basis of estimated tax revenue.

A 36-in. water main now serving the nearby Chrysler-Navy jet engine plant will be used by the new community and surrounding industry. The main is owned and operated by Sterling Township, which purchases water from Detroit.

The Big Switch is to Copyflex



More and more Copyflex machines are replacing other types of reproduction equipment for these reasons:

1. Copyflex makes top-quality black and white prints as fast as 30 linear feet per minute and for a cost as low as 2c a square foot, depending on the model you need.
2. Copyflex has available an unsurpassed variety of sensitized paper, cloths, and films. You get a convenient and economical single source of supply and service to meet all operating needs.
3. Copyflex is precision engineered for a lifetime of trouble-free service.
4. Copyflex can be operated easily and well by anyone with 5 minutes' instruction.
5. Copyflex requires only an electrical connection to operate.
6. Copyflex is absolutely odorless, quiet, and clean—no fumes, no exhaust ducts.
7. Copyflex requires no permanent installation—is mounted on castors for mobility.

See if you don't agree with the ever increasing number of engineers and draftsmen who are changing to Copyflex. Compare Copyflex advantages with the performance of your reproduction machines. We think you'll find the differences in favor of Copyflex worth investigating. Mail coupon today for information on models and prices.

BRUNING Copyflex

Best Process! Best Machines!
Best Selection of Materials!

Specialists in reproduction since 1897

Charles Bruning Company, Inc., Dept. 810
4700 Montrose Ave., Chicago 41, Ill.

Please send me information on Copyflex reproduction machines.

Name_____ Title_____

Company_____

Street_____

City_____ County_____ State_____

INDIANA TOLL ROAD | Uses Armco Foundation Pipe

Driving Armco Foundation Piling for the Indiana Toll Road. This installation is a bridge project over the Sycamore Road, 10 miles northwest of South Bend, Indiana.

Rieth-Riley Construction Company, Inc.— General Contractors
Chapin & Chapin, Inc.— Sub-Contractors
J. E. Greiner Company— Consulting Engineers
Charles W. Cole & Son— Contracting Engineers
Pierce, Gruber & Beam, Inc.— Sub-Contracting Engineer

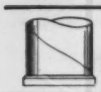
One of the newest expressways in the country is the Indiana East-West Toll Road, now under construction across northern Indiana.

In Sections C-24 and C-25, Armco Foundation Piling is being driven for a bridge foundation. This piling is 14″ O.D., in .188″ wall, with a design capacity of 30 tons. Many of these piles were actually driven over 60 tons capacity without difficulty. This is just one of six grade separations in these sections.

FOUNDATION PIPE FOR EVERY NEED

Few foundation pipe jobs are alike. But with Armco Pipe Piles, Caissons and Pile Shells to choose from—you'll find it easy to match almost any requirement. See table for sizes.

ARMCO FOUNDATION PIPE

DESIGN	PRODUCT NAME	DIAMETER O. D.	WALL THICKNESS	LENGTHS
	ARMCO PIPE PILES	8⅝″ to 22″	.141″ to .500″	Up to 93 feet
	ARMCO CAISSONS	24″ to 36″	.375″ to .500″	Up to 70 feet
	ARMCO HEL-COR PILE SHELLS	8⅝″ to 22⅛″	18 to 14 Gage	Up to 60 feet

For specific data on your foundation problems, write us. Armco Drainage & Metal Products, Inc., Welded Pipe Sales Division, 3955 Curtis Street, Middletown, Ohio. Subsidiary of Armco Steel Corporation. In Canada: write Guelph, Ontario. Export: The Armco International Corporation.

Workman welding cone points to the Armco Foundation Piling used on this project.

ARMCO®

ARMCO FOUNDATION PIPE

INEXPENSIVE TESTS in San Francisco Bay mud covered by shallow water are made by two-man crew with simple equipment. Third man is inspector.

MANPOWER is enough for retractable-plug sampler and vane-shear testing.

How to Stretch Soil-survey Dollars

Low-cost tools for subsurface exploration broaden the usefulness of a few expensive cased borings.

S. S. Cooke-Yarborough
Knappen-Tippetts-Abbett-McCarthy
New York, N. Y.

It is sad but true that the budget for subsurface investigations usually is paltry when an owner gets through trimming his engineer's recommendations for an up-coming construction project. The soils engineer then must proceed to make the most of what he has left, perhaps muttering about policies that are penny-wise and pound-foolish.

For the foundation has to be safe. With limited data on subsurface conditions the soils and foundation engineers must be conservative in their designs, the meanwhile being acutely aware that more information would enable more precise designs and, probably, construction savings far greater than the cost of adequate data.

In making the most of what he has, the soils engineer must look for techniques that will stretch his budget dollar. Some techniques are well-known, some are invented or brought from obscurity or from great distances. An example of the relatively unknown technique is the vane shear tester, a simple European device. Used in conjunction with two better-known methods, the vane shear tester may help yield complete coverage for restricted cost.

Two projects for which a complete coverage was obtained for relatively low cost are the proposed expansion to Metropolitan Oakland International Airport, Oakland, California; and the Puerto Nuevo-Martin Pena Market Development, San Juan, Puerto Rico.

At Oakland a new runway, taxiways and terminal area are to be constructed up to one mile offshore from the present airport. This requires filling in San Francisco Bay on a very soft clayey organic silt deposit, which varies in thickness from 9 to 18 ft. Water depth varies from 0 to 5 ft at low tide, and the normal tide range is 6 ft.

At San Juan a 100-acre site is to be filled, sand-drained and surcharged prior to development of a wharf and a marketing center. The site is in swamps at the south side of San Juan Bay and is partially covered by water. Those portions not covered by water are mostly mangrove swamp, where the ground is so soft that it barely supports a man. Elsewhere, maximum water depth is about 2 ft at low tide; tide range is 1 ft. Foundation conditions are notoriously bad, consisting of 25 to 35 ft of very soft clayey organic silt, overlying firmer deposits.

• **Tools for the tests**—The success of these projects depends primarily upon the foundation design, and since both areas are large, it was expected that the conditions would vary considerably from point to point over the sites. How to obtain adequate subsurface data within reasonable costs was a problem. It was solved, however,

VANE SHEAR TESTER is attached to actuating rod in retractable-plug sampler.

TORQUE MEASUREMENT is taken as vane shear tester is rotated by rod.

by three methods: Conventional cased borings yielding drive, shelby tube and stationary piston-type samples, one-inch retractable plug sampling, and in-place vane shear testing.

Of these, the first (and the most expensive) requires no introduction.

The one-inch retractable plug sampler is not new either, the principle having been first employed in a peat sampler 45 years ago. It has been used in various forms by several individuals and agencies, but the model used on these jobs was developed by the writer. A casing of 1¼-in. outside diameter is fitted with an annular bit at the lower end. A plug, attached to an actuating rod that passes through the casing, can be seated inside the bit circle. The lowest section of the casing receives a series of liner tubes through which the plug can pass.

In operation, the casing is pushed or driven into the ground with the bit closed by the plug. At the depth where a sample is required, the plug is retracted by withdrawing the actuating rod to a point where the plug can be secured. This prepares the sampler to receive the sample. The sampler is then advanced to fill the liner tubes, after which it is withdrawn from the ground by jacking and the liner tubes removed for recovery of the samples.

Since the casing and actuating rods are in 3-foot lengths and the driving hammer, which is a slip-weight working on a guide attached to the top of the casing, weighs only 35 lb, all parts of the sampler are easily handled and transported.

• **Vane shear test**—In-place vane shear testing is a technique developed in Europe and used quite extensively there. So far, its use in the United States has not been widespread and has been largely confined to research work. The principle is that a rod—to which four thin metal vanes are attached—is forced into the soil and is then rotated until the soil around the circle circumscribing the vanes is sheared. The torque required to cause this shear is measured and the soil's shear strength is computed.

For the Oakland and San Juan projects a vane with an overall width of 2½ in. and height of 6 in. was attached to the bottom of the actuating rod of the retractable plug sampler, replacing the plug. The sampler was pushed into the soil with the vane unit projecting just below the bottom of the sampler. Eighteen inches above the level at which the vane shear test was required, advancement of the sampler was stopped. By pushing down on the actuating rod the vane unit was advanced 18 in. below the bottom of the sampler. The vane was then rotated by means of a torque meter fixed to the top of the actuating rod.

Upon completion of the test, the vane was retracted until it was once more in contact with the bottom of the sampler, after which advancement of the sampler was continued until a point 18 in. above the next test was reached. At Oakland the cost of the vane shear tests was about $5.00 each and in Puerto Rico $2.00 each.

• **Cased borings control**—At both of these sites a small number of cased borings were made at widely separated parts of the site. The areas between these borings were investigated by a relatively large number of one-inch borings and by vane shear testing. From each of the cased borings undisturbed samples were obtained for laboratory testing for shear, consolidation and physical constants.

Adjacent to each cased boring, vane shear tests were made at the same level from which undisturbed samples were taken. Specimens from the undisturbed samples were tested for shear strength by means of triaxial compression tests, imposing the overburden pressure as the confining pressure. By comparing the results of adjacent triaxial and vane-shear tests, a relationship between the two was established to assist in determining the true shear strength of the material.

• **Cased borings costly**—In order to make the cased borings in the unprotected water of San Francisco Bay, which frequently becomes rough, a regular 40x16-ft piledriving barge with a crew of four had to be used to provide adequate space and safety.

In addition, a tug had to be in attendance at all times to assist in moving and mooring the barge, and to move the personnel between the barge and shore. Moreover, the draft of the barge made moving at low tide difficult, thus requiring working with the tides and resulting in extra costs for overtime.

The one-inch sampler, on the other hand, was run by a two-man crew from a 16x8-ft steel scow. The sampler was operated through a 10-in. pipe passing through the center of the scow and required only hand tools to operate it. The scow was equipped with an outboard motor and thus was self-powered. Furthermore, its shallow draft allowed free movement over the site at all stages of the tide. These factors resulted in the price for one-inch borings being $3.70 per ft less than for the cased borings.

• **Two rowboats enough**—In Puerto Rico, the shallow water over much of the site and the small tide range, made moving a full sized rig difficult, and much time was lost waiting for the tide to give flotation.

The one-inch sampler, however, was operated from a deck consisting of boards fixed to the gunwales of two shallow-draft rowboats. This float could move over all the water-covered portion of the site at low tide. This mobility together with the smaller crew required, resulted in a bid $4.25 per foot less for the one-inch borings than for the cased borings.

In addition, for moving a drill rig into position through those parts of the site covered by mangrove swamp, the contractor bid $9.00 per hour, but the cost of moving the one-inch sampler through the same swamp was absorbed in the unit price for one-inch sampling.

• **Quantities**—Economy of the system and coverage obtained can be seen from the quantities of work performed at each site. At Oakland 354 ft of cased hole were made, 428 ft of one-inch boring and 47 vane shear tests, while in Puerto Rico the quantities were 417 ft of cased hole, 655 ft of one-inch boring and 337 vane shear tests.

Of course it must be realized that the use of the one-inch retractable plug sampler and vane shear test attachment is limited to soft silts, clays and loose sand. Furthermore, limitations of the information obtained must be realized. For instance, one-inch sampler specimens must not be considered undisturbed samples.

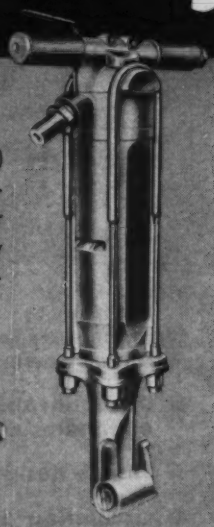
• **Vane test reliable**—On the other hand, the shear-strength values given by the vane shear tests probably are as reliable, if not more so, than those obtained by triaxial compression testing, since they measure the shear strength of the soil in place.

Design, supervision and analysis of the foundation explorations at Oakland were performed by Knappen-Tippetts-Abbett-McCarthy for the Port of Oakland, for which Dudley W. Frost is port manager, Joseph G. Bastow is assistant port manager and chief engineer, and Don W. Martin, airport manager. The work in Puerto Rico was performed for the Puerto Rico Transportation Authority for which Salvador V. Caro is general manager and Raphael Seijo Tizol is chief engineer. For both jobs Walther Prokosch was project engineer, while the writer was in charge of the foundation investigation and design.

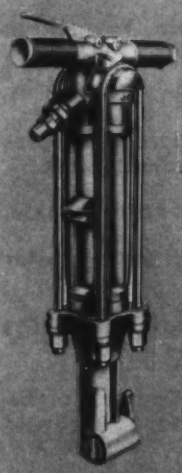
K-89 (90 lbs) Extra heavy blows for breaking tough, dense concrete sections.

Here's what you get in a

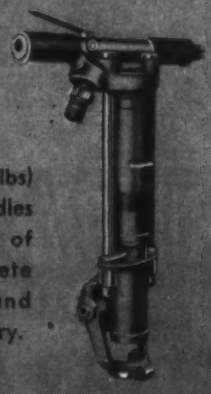
JOY PAVING BREAKER



K-81 (80 lbs) Rapid, powerful blows for breaking heavy reinforced concrete paving.



K-61 (65 lbs) Wide range of application for medium demolition and heavy spading.



K-31 (30 lbs) Easily handles demolition of thin concrete sections and light masonry.

LONG WEAR Cadmium plating inside and out prevents rust and corrosion. Cadmium, which develops lubricating qualities under heat and stress, eliminates scoring and facilitates running-in. Long life is further assured by a throttle-controlled lube system. Each movement of the throttle shoots exactly the right amount of oil to all working parts.

ECONOMICAL OPERATION A unique mechanism . . . the Dual Valve . . . gets the *maximum* out of your air supply. By controlling the air on the *up* stroke as well as the down, the Dual Valve actually makes air do more work.

RUGGED, SIMPLE CONSTRUCTION U-type side rods give the balanced tension of *four* rods. This assures perfect alignment of parts, eliminates old-fashioned side rod springs, and stops side rod breakage. The breaker tool is held tightly by a cam-type retainer—a simple flip down to release or up to secure. It has no troublesome nuts, bolts, lock washers, springs, etc.

OPERATOR COMFORT The piston of a Joy Breaker never strikes the front head. A cushion of air absorbs the blow after the full force has been delivered to the breaker tool. This reduces shock, vibration and operator fatigue. The streamlined design allows the operator to lift and slide the breaker against his leg without collecting bumps and bruises from projections.

FREE BULLETIN Complete details on Joy Paving Breakers can be had by writing for Bulletin 87-P to ***Joy Manufacturing Company, Oliver Building, Pittsburgh 22, Pa.*** In Canada: *Joy Manufacturing Company (Canada) Limited, Galt, Ontario.*

Consult a Joy Engineer

JOY W&D C-3497

CONSTRUCTION EQUIPMENT MANUFACTURERS FOR OVER HALF A CENTURY

what POWER means on a small BLACK TOP PAVER!

Here is the Adnun Jr. starting the fourth course from the curb on a parking lot. On each course the Adnun put itself in position under its own power, ready for the truck. Truck time was reduced, back breaking labor was eliminated and the cost of the job was less.

The Adnun Jr. is the only tow-type bituminous paver that brings you the advantages of engine power for moving the empty paver on the job. In close quarter work, up against garage doors, inside of walls, close to buildings, in fenced playfields and similar work, Adnun power is an invaluable time saver and cost reducer. It eliminates much hand work, cuts down on manpower and makes possible a better job.

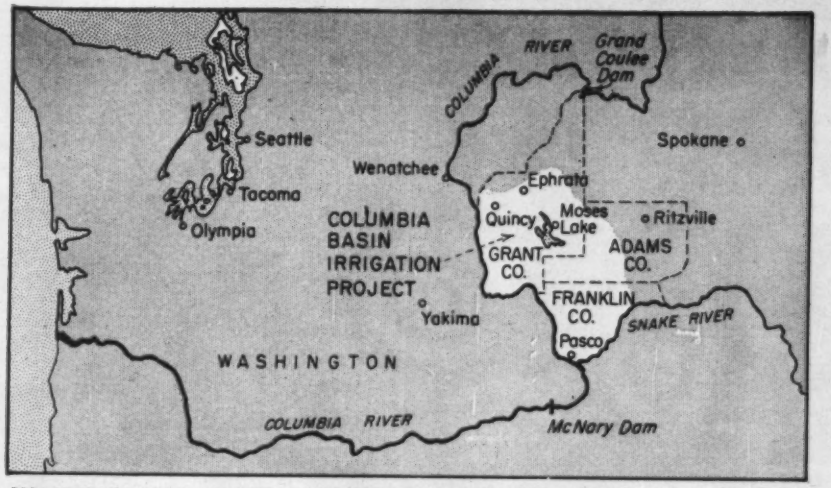
If you are bidding on non-highway specification work, the Adnun Jr. will permit better bids and give longer, trouble-free service. Ask for details on this high-quality tow-type rig.

- **Maneuvers for new location under power.**
- **Demountable Tow Hitch eliminates need for trailer.**
- **Simple design.**
- **Oscillating Screed assures tight longitudinal joints.**
- **Dual controls on either side.**
- **Breaker Bar gives better compaction.**
- **Anti-Friction Bearings throughout.**
- **Continuous Course Correction for more accurate leveling.**

BLAW-KNOX COMPANY
FOOTE CONSTRUCTION EQUIPMENT DIVISION
1922 State Street
Nunda, New York

BLAW-KNOX

ADNUN JR
MODEL 8
BLACK TOP PAVER



WASHINGTON'S GRANT COUNTY must provide 800 miles of farm roads. Other Columbia Basin Irrigation Project counties—Adams and Franklin—have similar, but less extensive, works programs.

Problem: $7-Million County Road Net

Newly-opened irrigated land needs roads—Good financing, good engineering provides answers for Columbia basin

The mammoth task of building 800 miles of farm-to-market roads in Grant County, Wash.—heart of the million-acre Columbia Basin Irrigation Project—is now about half completed. When the job is done, the roads will serve new farm homesteads covering two-thirds of the Bureau of Reclamation's largest irrigation project.

The $7.3 million program has presented County Engineer James Dodson with the job of building more miles of new roads than a number of state highway departments construct over a period of years. How it's being done is a lesson in "boot-strap" operations.

What makes the road construction program necessary is gradual development of the irrigation program.

The first 66,000 acres of Columbia Basin project lands went under water in 1952, and the program calls for an additional 50 to 60,000 acres annually for several years to come. The land—previously all but uninhabited—is divided into "family sized" farms of 60 to 120 acres each.

• **Financing**—The road construction program is being financed by federal aid and by a Columbia Basin bond program authorized by the state.

The legislature, in 1951, authorized a $5 million bond issue for road building in the three basin counties of Grant, Franklin and Adams. The bonds are amortized by withholding a share of each county's allocation of state gasoline tax revenue over a 25-year period. This method permits repayment under existing levies and tax rates without changing the state's basic highway financing practices.

The plan was devised by Dodson, who at 55 has had 35 years experience in road building work. Helping in the plan development were Neil R. McKay and Avery Loethspeich of the Washington State Highway Department, and Paul Bickford, of the Bureau of Reclamation.

Dodson and the others sold the state legislature on the idea of using the state motor vehicle fund as a security for the bond issue. The legislature provided, however, that not more than 50% of any county's share could be withheld for this purpose.

Gasoline tax revenue in the state is now being distributed to the counties under a factor system, whereby a weight of 70% is allotted to trunk road mileage. And since about 90% of the county road network in Grant County (in the project area) could qualify as trunk road mileage, the new roads would readily generate the revenue to meet provisions of the bond retirement program.

The situation could prevail regardless of where the money was borrowed. However, only the state legislature could insure continuation of this method of distribution over a 25-year period. Thus, the salability of the bonds would be assured by a guaranteed amortization program.

Grant County's share of the 1951 bond program amounted to $3.2 million and Dodson is now trying to get the 1955 legislature to extend the bond program to permit completion of the Basin road building project. Grant County will need another $2.5 million in bond money and $1.6 million in federal aid to finish the job.

Already built or ready for construction in the Grant County portion of the Basin project are more than 400 miles of farm to market roads, of which 100 miles are arterials and the rest feeders. Arterials are being built at an average cost of about $14,000 a mile and feeders at about $7,500. Average cost for all roads runs from $9,000 to $9,200.

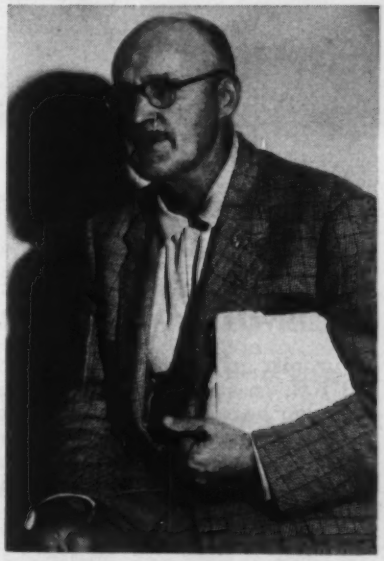
• **Lineal mile bids**—If Dodson's plan for financing the road program was unique, so was his approach to the engineering job.

After clearing the financial hurdle, he started giving serious consideration to having the roads built on the lineal mile bid basis instead of the usual unit price bid. He talked the idea over with local contractors and state highway officials—some of whom were skeptical at first. After three years' experience with this method, he points out that the results have been gratifying and contractors generally have been turning in lower bids.

Under the lineal mile plan, contractors bid on the grading, draining and surfacing, all in one job. Dodson points out that with the old unit price plan contractors tended to bid high on the excavation and low on the surfacing.

"The cubic yard bid doesn't give the final cost, it only gives a comparison of bids to determine the low bidder," says Dodson, who points out that unit price jobs can and often do overrun the original bid figures.

(*Continued on page 42*)



COUNTY ENGINEER, James Dodson, directs Grant County road construction. He helped convince the state legislature that a bond issue was necessary.

Portable plant proves best for Turnpike job

HIGHLAND AGGREGATES MOVES PLANT ALONG 100-YEAR-OLD WASTE PILES TO PRODUCE BASE COURSE

Turnpike . . . TURNPIKE . . . TURNPIKE. In some areas that's about all you hear discussed among construction men these days and it's a good thing too, because goodness knows, our whole highway system has been lagging long enough.

Modern plant in old quarry

One of the exciting examples of modern highway construction is the Ohio Turnpike, and up near South Amherst, in Ohio, you'll find an interesting operation in progress. There, at an old, old quarry, you'll find a modern, up-to-date crushing plant producing base material from 100-year-old refuse piles of cut stone waste.

Now processing base material isn't exactly news in itself. But construction men *are* interested in why a portable Two-Unit plant was placed on this job.

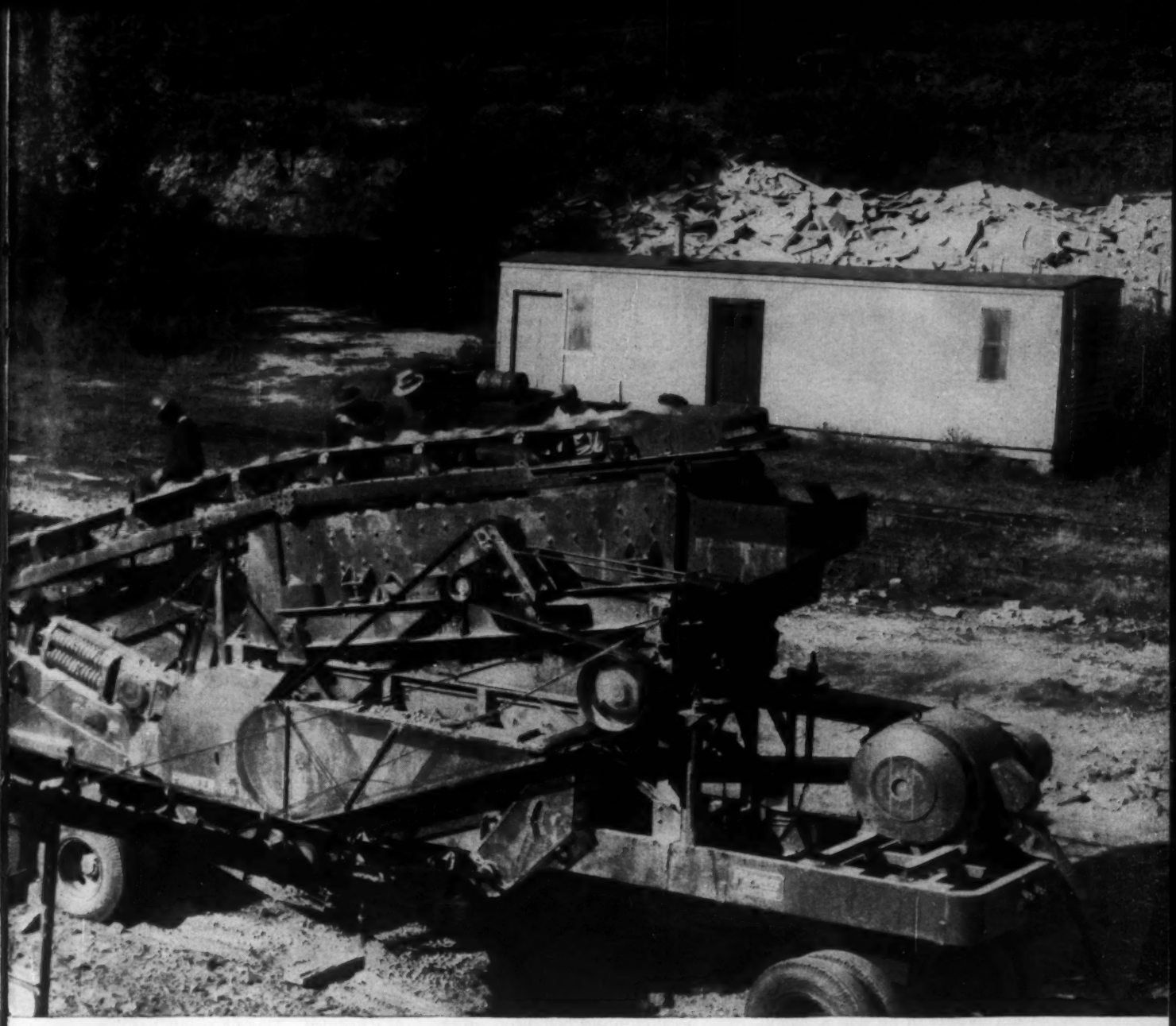
Old piles hold usable material

It all started when the Highland Aggregates Company discovered that these huge piles of waste rock, owned by Cleveland Quarries, were suitable for use on the Turnpike. But this rock, having been dumped in a long row by railroad cars, posed a problem as to selection of the right kind of crushing plant.

J.W.Gutermuth and A.J.Hoffman, executives of Highland Aggregates Company, referred the problem to their equipment distributor, the Williams Tractor Company, who in turn, called in a PIONEER expert. A survey of the material and site showed two alternatives: (1) a stationary set-up, using trucks for all hauling or (2) a portable rig, to eliminate trucks for hauling the feed.

A "natural" for a portable plant

The economics involved showed that this was a "natural" for a Two-Unit portable plant, even to placing the



step-down transformers for the electric power in a portable house. Thus it remained only to determine from the size of feed, the gradation of the product, and the output desired—the proper size of plant.

In the PIONEER plant selected, the primary consists of a 3042 jaw crusher and a 42″ x 14′ apron feeder. The secondary includes a 54″ x 24″ twin roll crusher and a split feed type 4′ x 12′ 3½ deck vibrating screen.

Split feed yields extra output

Normally, in an installation of this kind, one might expect to find a bottleneck in screening capacity. However, in the split feed screen, found only in PIONEER plants, decks are so arranged that half the product from the crushers is fed to the top deck and half to the bottom deck. Oversize from both decks feeds to the twin roll for secondary reduction. Material passing top and bottom decks is collected in the hopper under the screen for delivery to trucks.

Offers twice normal screening area

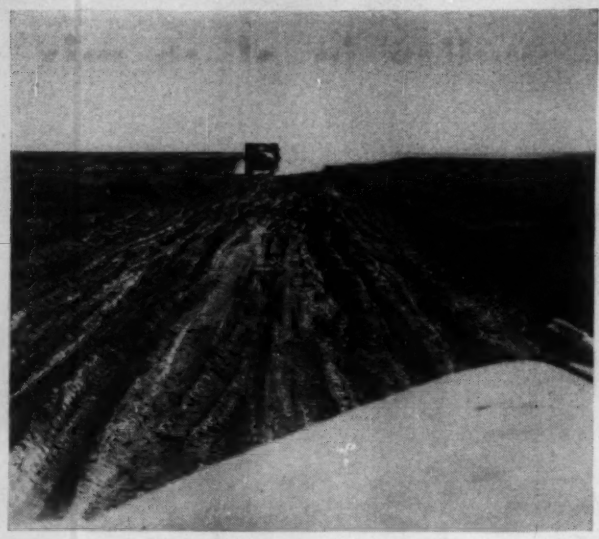
This arrangement of the screens actually provides *twice* the normal screening area of a 4′ x 12′ screen, or 96 square feet—and makes possible a production figure in this case as high as 400 tons an hour, and an easy average of 300 tons.

PIONEER Two-Unit Plants for both rock and gravel combine the advantage of large units with that of easy portability, and provide a flexibility in operation which is not possible in any other type plant. For example, the secondary can be used separately from the primary to permit crushing from surge piles, or each plant can be used independently on a different job.

Available, too, is the exclusive PIONEER triple roll secondary, which allows the feeding of larger rock to the rolls. This increases production because the jaw crusher in the primary can be operated at a larger setting.

For full particulars on the application of the Two-Unit Plant to your operations, write to Pioneer Engineering Works, Inc., Minneapolis 13, Minnesota (subsidiary of Poor & Company, Chicago) or see your nearest authorized PIONEER Distributor.

Pioneer
Continuflo **EQUIPMENT**



RUTTED, DUSTY ROADS like this are being replaced.

BRIDGES are built under direction of Bureau of Reclamation.

The lineal mile bid, he adds, is figured by the mile of completed road and can't exceed the bid figure.

"The lineal mile bid makes the contractor get down to business and figure the job on an actual cost basis to complete the work. He can't get the plans changed and there are no arguments over classification of excavation."

• **Engineering**—Dodson and his crew of 30 engineers in the county highway department have been faced with several construction problems. The engineering staff mapped out a road network in which no farm unit in the county would be more than two miles from the nearest arterial. Feeder roads were planned to serve every farm unit.

Roads were planned to follow the contours of the land as much as possible and many of the feeders were routed parallel to the laterals carrying water for the project.

The character of the soil is a problem in itself. Prior to canal construction by the Bureau of Reclamation, says the engineer, road building would not have been possible on the same basis.

The light volcanic ash found in many parts of the Basin is extremely hard to handle—it has a tendency to shift or blow away.

But the construction of canals and laterals has made the job somewhat easier. Reclamation construction work and road building have gone along hand in hand. Water sent through the canals and laterals is readily available for wetting down the grades in the road building work.

• **Water problem too**—Although water is a blessing, it also is a problem. Much of Grant County's road mileage is being built near or parallel to canals and laterals. These waterways often leak during the first few years after construction and the seepage has sometimes threatened to undermine roads under construction or already built. More water comes from the runoff or waste water from farm units already under irrigation. In some cases road building work has been halted during the irrigation season because of the water problem.

• **Standards**—Dodson started out with an arterial design that was 26 ft wide with a 5-in. thickness of coarse ballast and 2-in. thick top gravel course. Ditch slopes are 2 to 1. However, he points out that the original design has been altered.

The Bureau of Public Roads insisted that the county show an average daily traffic of 100 cars a day before oiling arterials being built with federal aid money. As a result, there were cases where the top course and ballast became mixed before oiling. Accordingly, it was decided to reduce the size of the base material from 3 in. minus rock to 1 in. minus rock. This makes road maintenance before oiling much easier.

Feeder roads were designed to be 24 ft wide with 1650 tons of 1 in. minus single course surfacing to the mile. In actual practice, Grant County has been placing an average of 1000 tons to the mile, placing the other 650 tons in stockpiles to be used as needed for maintenance.

In addition to providing water, Bureau of Reclamation canal construction has made available for the road building program material excavated for canals. And bridges crossing the canals and laterals are built by the Bureau of Reclamation as part of the irrigation construction program.

Another problem was securing an adequate staff of engineering personnel for the road building job. Experienced engineers were hard to find, the staff had to be built around a small number of experienced men, supplemented by recent graduates. At one time this staff totaled 57.

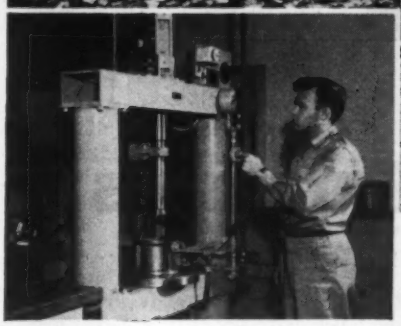
• **Leader**—Grant County—at the north end of the project where the first irrigation development was scheduled—was forced into the position of leadership in the road program, Dodson declares. Before the work was started the county's existing road system included about 1,900 miles of largely unimproved dirt roads which had been serving a dry land farm area. The deluge of vehicles and construction machinery mobilized to construct the irrigation system caused rapid deterioration of the lightly-surfaced existing roads.

"Something had to be done quickly if the development was to go forward as scheduled," Dodson points out. "It was a huge task for poor, sparsely-populated Grant County."

Grant County started out the program in 1951 by letting a few minor road contracts. About 150 miles of roads were completed in 1952, 150 in 1953 and the 1954 figure is expected to hit 116 miles. Another 116 miles are expected to be completed in 1955 and 67 miles a year for each of the four succeeding years.

"Our plan was to make the money go just as far as possible," Dodson says, "making such good use of the funds that upon their exhaustion new money would be provided. This meant that not only were we engaging in a race against time, but also every action had to be carefully weighed as to its effect on future financial support."

BITUMULS® assures high-quality in-place mixes



WHEN you're working with native or in-place material and you get a thoroughly-coated mix like this rolling off the blade, it's no accident. There's a reason for it, and that reason is *Research*.

Road-builders are always confronted with the problem of making their materials, methods and equipment fit each job. Many years ago we faced the fact that, as far as asphaltic binders were concerned, the Road-builder's problems were our problems. It was then that we turned to *Research* for the answers.

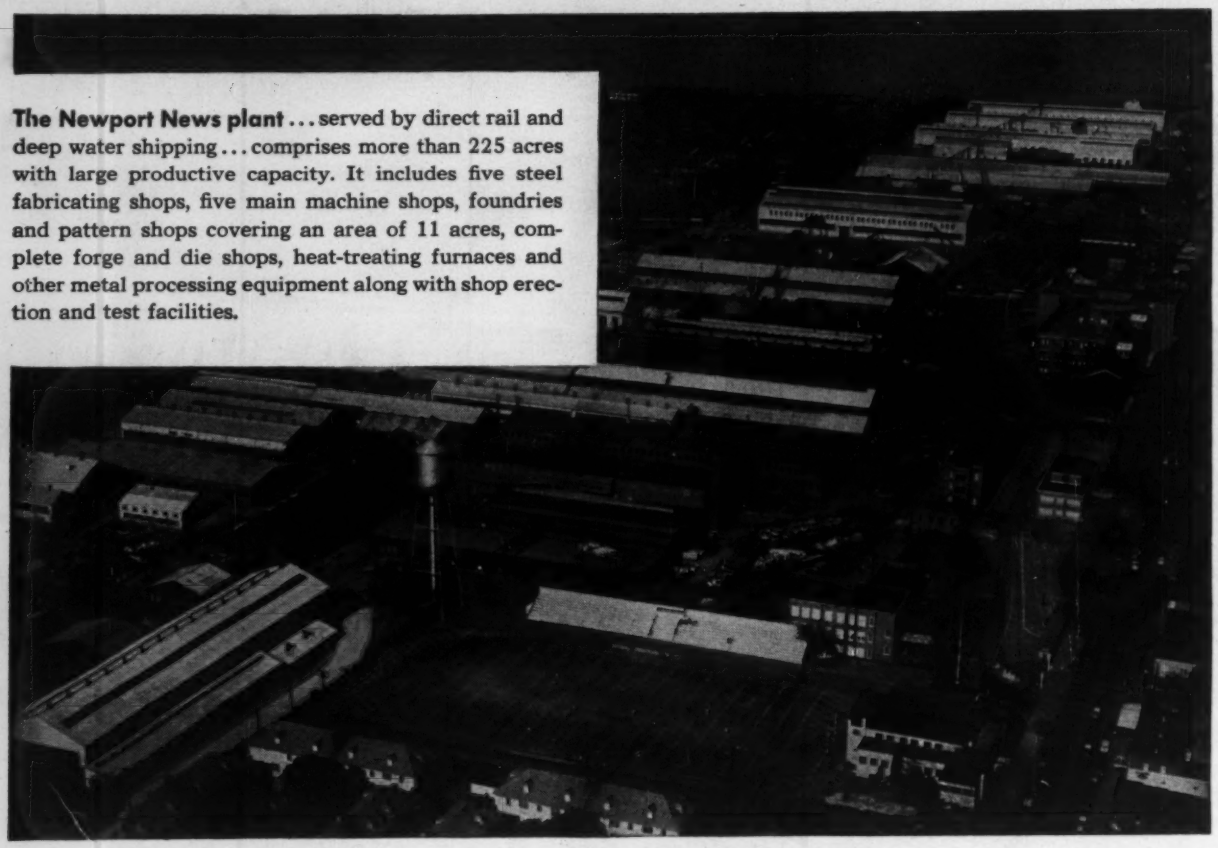
Today, we maintain the most extensive research program in the industry. Over the years have come such developments as Bitumuls for use with "hard-to-coat" native aggregates; Bitumuls for use with damp or wet aggregates; Bitumuls for use in damp or inclement weather. Each new development has been designed to assure fast and thorough coating of aggregates to produce a high-quality mix with uniform drying characteristics.

Bitumuls—emulsified asphalt for cold-application—is available in Mixing Grades as well as in grades designed for Surface Treatment and Penetration work. Full technical information on all grades is available from Bitumuls Engineers who work out of offices from coast to coast. In addition, illustrated booklets containing data on Bitumuls application are available without obligation.

AMERICAN Bitumuls & Asphalt COMPANY

200 BUSH ST., SAN FRANCISCO 4, CALIFORNIA

E. Providence 14, R. I. Perth Amboy, N. J. Baltimore 3, Md. Mobile, Ala. Cincinnati 38, Ohio
Columbus 15, Ohio Tucson, Ariz. Seattle, Wash. Baton Rouge 2, La. St. Louis 17, Mo.
Inglewood, Calif. Oakland 1, Calif. Portland 7, Ore. Washington 5, D. C. San Juan 23, P. R.



The Newport News plant ... served by direct rail and deep water shipping ... comprises more than 225 acres with large productive capacity. It includes five steel fabricating shops, five main machine shops, foundries and pattern shops covering an area of 11 acres, complete forge and die shops, heat-treating furnaces and other metal processing equipment along with shop erection and test facilities.

Make Newport News your source for fabricated metal structures

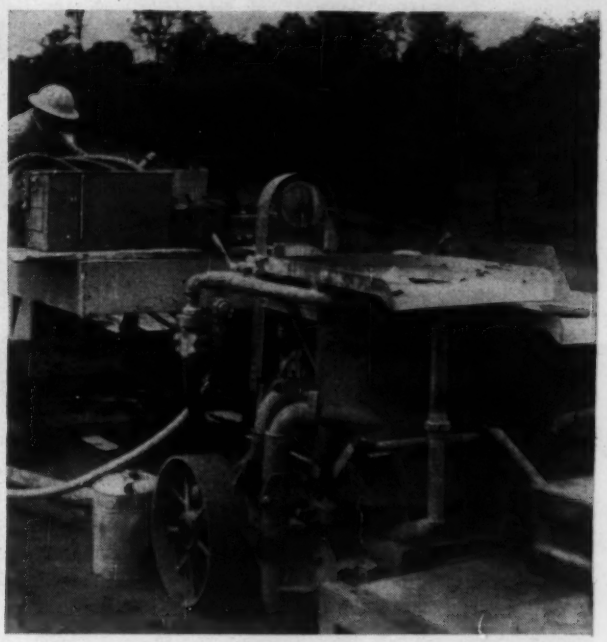
Let Newport News fabricate your weldments or sub-assemblies. Call on us for plate fabrication...from vacuum tanks to bridge caissons ... for pumps, valves, pipe lines ... you'll find that Newport News fabricates parts to answer most demands.

In the vast plant, shown above, Newport News craftsmen complete your orders with specialized production techniques, and with sound experience acquired through construction of thousands of products ranging from small components on rayon spinning machines, to the giant 165,000 hp hydraulic turbines at Grand Coulee.

See for yourself what Newport News is doing, and how this company's high integration of skill and production facilities can help you. Get the facts, shown in *Facilities and Products.* A copy of this illustrated booklet is yours for the asking ... write for it now.

Newport News
Shipbuilding and Dry Dock Company
Newport News, Virginia

GROUT MIXER can produce batch of low water-cement ratio grout in 15 seconds.



GROUT PUMP of conventional style (left) moves the mixture. Grout mixer (right) has two chambers.

Mixing Machine Speeds Folsom Dam Grouting

Cement slurry mixers modified to produce neat cement grout have facilitated foundation grouting at Folsom Dam and its auxiliary structures. The English-made units—Colcrete mixers—are a type relatively new to the U. S. Good wetting action and fast mixing time of the machines have sped the work.

The machine has been used extensively in Europe in mixing a sand-cement grout for pumping into preplaced aggregate. It has two mixing chambers. Cement and water are usually mixed in one tank, then pumped into the second tank where the sand is added. The mixers have a centrifugal action of the colloidal mill type that thoroughly wets particles to minimize segregation during handling.

Two of the units were purchased by the Corps of Engineers after extensive tests. The units were modified to make them more suitable for mixing a neat cement grout. Controls were changed so that the two mixing tanks could be operated together or separately. Capacity of the smaller mixing tank was increased to make the two equal. A metered water system was added to serve either tank. And the tops of the mixing chambers were turned to face the rear so a single workman can charge cement into them. With these modifications, the machines are capable of mixing up to 300 sacks per hour of neat cement grout.

Because the thorough wetting of the cement particles permits less grout segregation, it is believed that more grout has been placed in finer rock seams at Folsom than would have been possible through use of a conventional mixer. Further, the 15-second mixing time is considerably less than needed by conventional equipment—particularly when a low water-cement ratio such as 0.6 and 0.5 is used. And the machine can be cleaned by pumping only 6 to 8 cu ft of water through it.

Two grouting contractors have worked on the Folsom project using grout mixers supplied by the Corps of Engineers. Selby Drilling Corp. has the contract for grouting through the fill at Mormon Island Auxiliary Dam—an earthfill structure, 4,820 ft long with 110-ft maximum height. Continental Drilling Co. is grouting the foundation of the main dam—a 340-ft high, 1,400-ft long concrete gravity structure.

Folsom Dam is a multiple purpose project located on the American River 24 miles northeast of Sacramento, Calif. It is a project of the Sacramento District, Corps of Engineers, Col. Wm. J. Ely, district engineer. Bruce E. Clark, geologist, has supervised the grouting work for the Sacramento District.

GROUT IS INJECTED through the fill in the conventional manner. Drill tower in background drills holes in advance of grout mixing and pumping equipment.

Clyde Whirley does hook work at Sandy Hook

WORKHORSE ON THE HOUSATONIC
is this Clyde Whirley at work on the Connecticut Light and Power Company's dam at Sandy Hook.

Clyde now offers a new line of Whirleys that offer the ultimate in safety, efficiency and ease of handling. Starting with the hoist, you'll find a unit specially designed for Whirley service. Drums are narrow to assure a better cable spooling. This permits the entire hoist to be narrowed so that, except on the largest size, the machinery cab can be shipped intact with the machinery in place . . . a feature that substantially reduces erection time and costs.

Ball and roller bearings on all shafts and drums minimize maintenance and reduce friction, thus effecting additional economy in power savings.

Air operated band friction clutches, brakes and boom drum pawl give smooth, positive and safe load control at all times, with no effort on the part of the operator.

The rail circle is supported at every point by main side beams and diagonal beams of the rigid turntable. Wide flange, uncut beams with box-section cross girts and diagonal bracing form the rotating frame which supports the A-frames, boom and machinery cab.

The rotating frame turns on equalized wheel carriages which permit definite determination of actual wheel loads. The tapered wheels allow true rolling on the rail circle with no slippage.

It will pay you to carefully consider these and all other cost-cutting, profit-boosting 'Quality-Plus' features of the new line of Clyde Whirleys. Without obligation you are invited to consult our engineering department relative to your particular needs.

If you haven't received a copy of the new Whirley Bulletin N-12, let us know. We'll be happy to send one to you.

HOISTS—DERRICKS—WHIRLEYS—BUILDERS TOWERS—CAR PULLERS—HANDI-CRANES—ROLLERS

CLYDE

CLYDE IRON WORKS, INC.
Established in 1899
DULUTH 1, MINNESOTA

ONE OF THE 16 INTEGRATED COMPANIES
BARIUM STEEL CORPORATION

How Soon for Mica Creek?

A $250-million project, to be built in Canada by private U. S. utility companies is on the boards—Here's an interview-report on how it stands, who's behind it.

In the 15 months since the Administration's "partnership" power policy was enunciated, (ENR Sept. 16, 1954, p. 26, July 15, 1954, p. 21) no projects have been undertaken. In the opinion of many, work will have to get underway soon in the Pacific Northwest or a power shortage will overtake that region by about 1960.

The Puget Sound Utilities Council, sponsor of the huge Mica Creek project on the Columbia River in Canada, appears to be as near to getting work underway as any agency. PSUC's Consulting Engineer, Jack D. Stevens, here reports on the status of the council's work:

What is the Puget Sound Utilities Council?

The council comprises five operating utilities in the Puget Sound-Cascade area in the State of Washington: Seattle City Light, Tacoma City Light, Puget Sound Power & Light Company, Snohomish County Public Utility District No. 1 and Chelan County Public Utility District No. 1.

These utilities operate 19 hydroelectric and five steam-electric plants with a total capacity of 1,600,000 kw, and also purchase power from the federal government under long-term firm power contracts.

Total utility assets are over one-half billion dollars and total gross annual income is about $65 million. Compared with other parts of the country, total revenues are lower in relation to total sales because the average power rate is lower in the Puget Sound-Cascade area. The five utilities serve over one-half million customers and have a combined peak load of about 1,500,000 kw in a load area embracing 60% of the population of the state and 64% of the industry. That's a thumbnail description.

What are the general objectives?

Briefly, the utilities agree that it is their responsibility to supply the total electric power needs of the Puget Sound-Cascade area for all purposes, including industrial growth, and they have declared their intention of doing so.

The utilities recognize the mutual advantages, savings and benefits to be obtained from joint planning, development and operation of power resources. They are working together to assure the area adequate electric power supplies at the lowest possible cost to the consumer.

How did you become associated with the council?

The council utilities recognized that one of the first steps in developing new power supplies is the employment of an engineer. They wanted a man with a utility background who could set up the program and provide the technical guidance to keep it rolling. I was selected for the job.

How long have you been associated with the electric utility business?

Quite a few years.

After completing my education in Oregon, I worked for one of the large utilities in California and went from there by way of engineering firms, contractors and private practice, to the Bonneville Power Administration, just prior to coming with the council. At B.P.A. I was in charge of hydraulic operations of the U. S. Columbia River System and power project planning.

What is the nature of the council's power program?

We now have nine hydro projects under investigation. These plants would add 1,700,000 kw of new capacity and 1,400,000 acre-ft of usable storage. Investigations will prove some of these projects to be infeasible, but a considerable number will be constructed. In addition, we are proposing to construct a $250-million dam on the Columbia River in British Columbia. This major dam would be located at the Mica Creek site about 200 mi north of the International Boundary.

Just how big is Mica Creek dam?

Tremendous. The dam will be a rock-fill structure about 700 ft above foundation—the largest dam of this type in the world. The reservoir will provide 10,500,000 acre-ft of usable storage for use through 940 ft of head at sites in British Columbia and 777 ft of head at projects which are now existing or under construction on the lower Columbia River in the U. S.

Four additional dams now under consideration will increase the latter figure to 1,171 ft.

What are these plants and how much additional power will be produced?

About 900,000 kw of prime power will be produced at the Mica Creek dam and 800,000 kw at the downstream Downie Creek and Little Dalles sites.

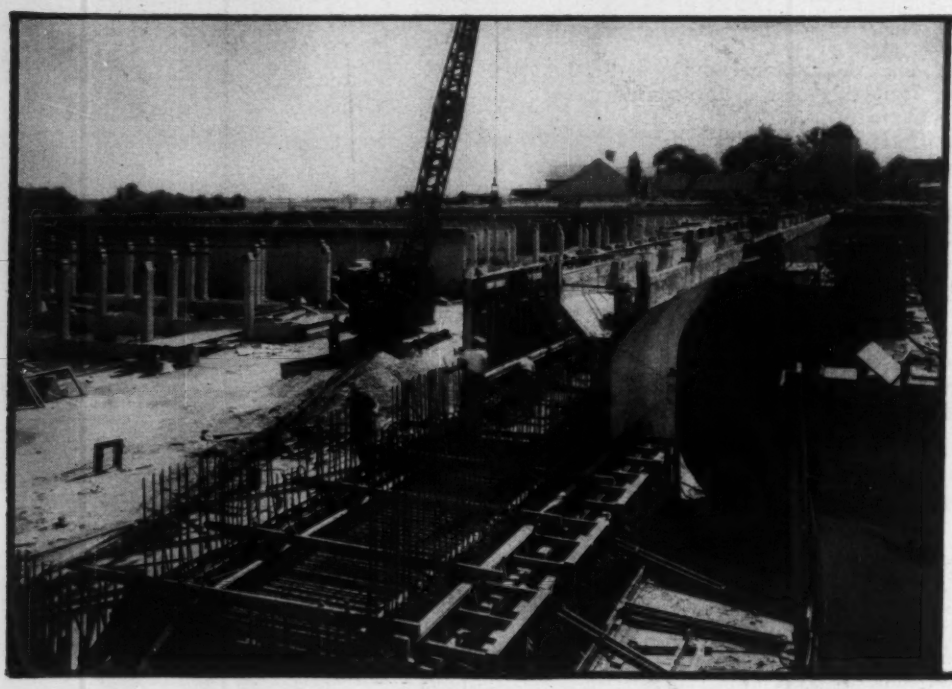
This represents a total of 1,700,000 kw of prime power to be produced in British Columbia. About 1,200,000 kw of prime will be produced from Mica Creek storage at Grand Coulee,

(*Continued on page 50*)

HERE—up above the U. S.-Canadian border—is where the big dam would go. Jack D. Stevens, consulting engineer in planning stages, is using the pointer.

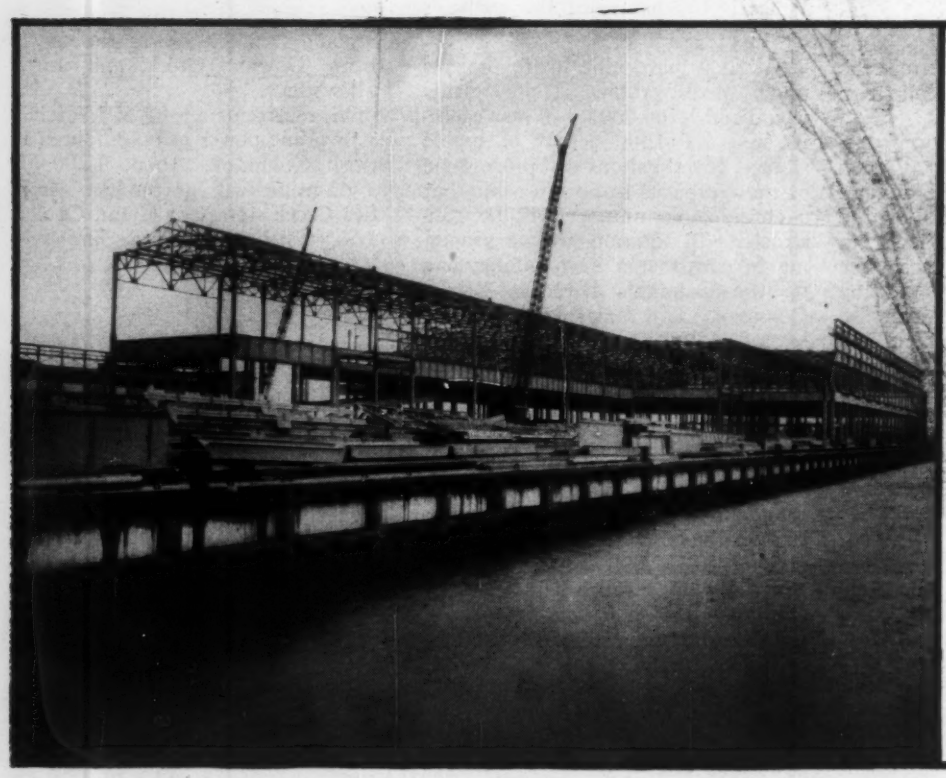
IT'LL BE A TREMENDOUS JOB—producing eventually 1,700,000 kw of prime power at the main dam and at four downstream structures.

KEEPING ACCIDENTS DOV



1

Supervised safety planning gets "repeat business" for this firm of general contractors. This is a new Sewage Treatment Plant.



3

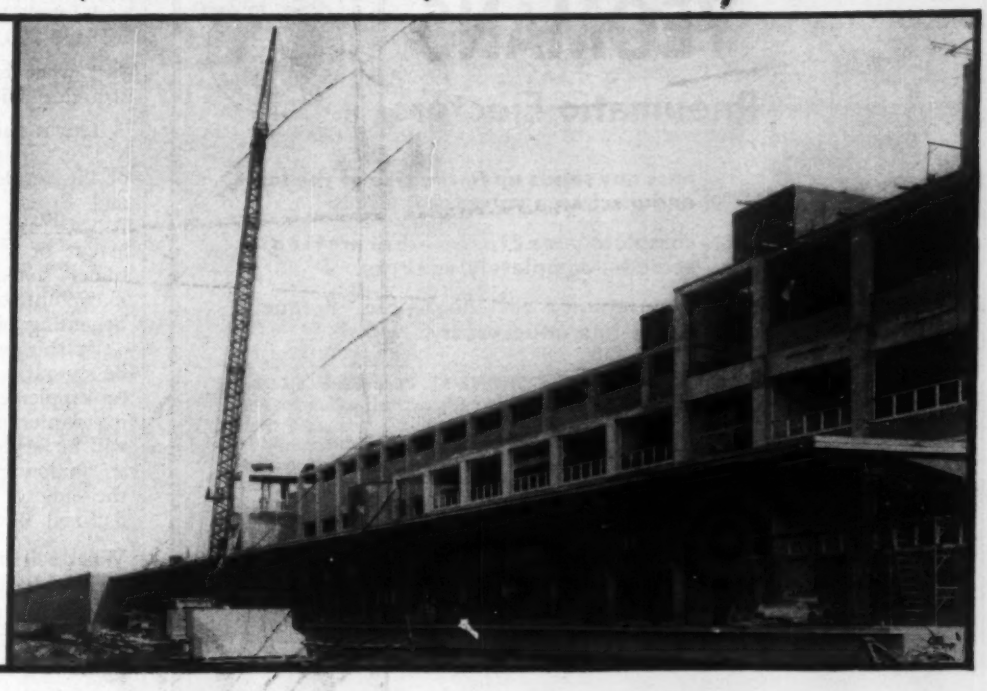
6,000 tons of steel are handled carefully and skillfully by the Hughes-Foulkrod Company in building this pier for the city of Philadelphia.

WN IN QUAKER TOWN!

(A brief case) by Mr. Friendly

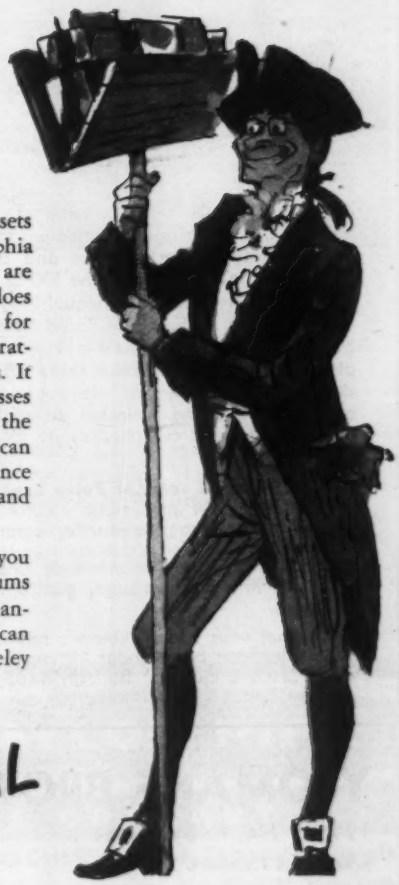
(2)

16 acres under one roof with 700,000 sq. ft. of floor space. The job was done for American Stores in Philadelphia. Safety planning trimmed time and costs.



MORAL:

Cement and bricks and steel beams can
Dent and damage the average man
And accidents hurt even worse
When they hit you in the purse!



An outstanding record for safety is one of the big assets that helps the Hughes-Foulkrod Company of Philadelphia keep its many important customers. Most of its jobs are "repeat business." This firm of general contractors does institutional, industrial, railroad and municipal work for many of the outstanding concerns of the country, operating throughout the eastern half of the United States. It owns all of its construction equipment. Top management stresses safety and makes a policy of keeping job volume within the capacity of executives to give personal supervision. American Mutual Safety Engineers have worked with this top firm since 1933, have helped it cut accidents and operating costs and achieve its enviable reputation for safety.

If you are interested in a personal-type service that can help you reduce accidents and produce substantial savings in premiums and operating costs, write today for your free copy of "Foremanship and Accident Prevention in Construction" to: American Mutual Liability Insurance Company, Dept. O-133, 142 Berkeley Street, Boston 16, Mass.

A M **AMERICAN MUTUAL**

Service from salaried representatives in 78 offices!
Savings from regular substantial dividends!

©1955, AMERICAN MUTUAL LIABILITY INSURANCE COMPANY

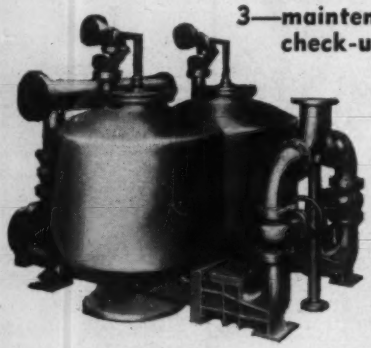
3 Outstanding Advantages of YEOMANS

Pneumatic Ejectors

1—pass any solids up to the size of the inlet and discharge valves.

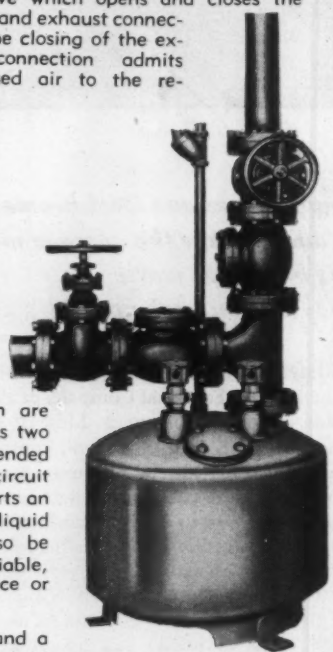
2—completely enclosed—hermetically sealed—completely sanitary.

3—maintenance cost negligible. Frequent check-ups unnecessary.



The SHONE(R) Pneumatic Ejector is recommended for capacities up to 1,000 g.p.m. and heads to 50 ft. It is a simple, sturdy, mechanically-controlled unit consisting of a closed receiver or pot with check valves on the inlet and discharge; a pilot slide valve actuated by two open cast iron bells suspended in the receiver; and a piston valve controlled by the pilot slide valve which opens and closes the pressure and exhaust connections. The closing of the exhaust connection admits compressed air to the receiver and forces the contents out through the discharge check valve and discharge charge pipe.

Action is positive; there are no internal parts to restrict flow; the sturdy, simple parts are few and do not move fast or far; there is practically no wear, and the pump is always ready for quiet, efficient service.



The EXPELSOR Pneumatic Ejector for small volume removal of solids-carry liquids in capacities up to 100 g.p.m. and larger, heads to 35 ft. Suitable for building and industrial plant waste, and medium-to-small sewage systems. Performance and operation are similar to the SHONE, but the EXPELSOR has two rigid metal electrodes of unequal length suspended in the receiver. The rising liquid closes the circuit between them and energizes a relay which starts an air compressor. Compressor shuts off when liquid drops below the longest electrode. May also be operated by steam pressure. Absolutely reliable, positive, trouble-free; requires no maintenance or attention.

More than 50 years of Pump Experience and a complete line of pneumatic ejector type pumps enable Yeomans to give you the recommendations and service which will serve you best. Unequalled experience in ejector installation and maintenance are the basis for these recommendations, and since Yeomans also produce a complete line of centrifugal pumps, these recommendations are completely unbiased.

Contact your Local Yeomans representative listed in the Yellow Pages of your telephone book under "Pumps" or write direct to factory for Bulletin 4005 SHONE Ejectors; Bulletin 4405, the EXPELSOR.

YEOMANS BROTHERS COMPANY

1999-1 No. Ruby Street **Melrose Park, Ill.**

® Registered Trademark

Chief Joseph, Rock Island, McNary, The Dalles and Bonneville. All of these projects are existing or presently under construction. Four additional projects under consideration are the Wells, Rocky Reach, Priest Rapids and John Day which, if constructed, will add 700,000 kw of prime power.

Just what is your proposal for constructing Mica Creek dam?

This is our proposal:

We will pay for the construction of the $250-million Mica Creek dam and British Columbia will own it. All we ask is that the 10,500,000 acre-ft of usable storage be released under schedules that will produce maximum total prime power from all benefiting plants.

By this procedure, flood flows will be stored in the summer and released to supplement low streamflows during winter months. Storage releases will be made in relation to load and streamflow patterns which are much the same on both sides of the International Boundary.

What will all this mean to the people of British Columbia?

Well, to begin with, they will get a $250-million dam. We will pay for it and they will own it.

No doubt they will wish to install generating facilities at the dam and build the downstream Downie Creek and Little Dallas projects. But they'll obtain a large block of prime power at Mica Creek at a fraction of the normal costs—the major cost of the project is in the dam and the Canadians will only be paying for the power facilities—so they will have exceptionally low cost power.

Power production at the two lower sites will also be low since it will include benefits from 10,500,000 acre-ft of upstream storage. A total of 1,700,000 million kw of prime power will attract large industries such as light metals and chemicals. New developments could include electro-processing of Canadian titanium ore, and petrochemicals associated with the country's petroleum resources. Briefly, the Mica Creek development will mean abundant low-cost electric power which will bring new industries, employment, and associated benefits.

How will council utilities get any power out of the deal?

Our share of power will come from the 1,200,000 kw of additional prime to be generated at U. S. Government plants as a result of storage releases at Mica Creek. We ask only that we receive an amount of prime power equal in value to our annual cost for constructing the dam.

In other words, we are asking the

government to deliver to us each year an amount of prime power equal to our annual cost, divided by the rate for government firm power at 100% load factor. The balance of the 1,200,000 kw of prime power will go to the government in payment for generating the power.

Will the U. S. government have to install additional generators at its plants?

Yes, at some of them.

A third powerhouse will be required at Grand Coulee. This new plant will have an installation of 720,000 kw and will cost about $98 million. Also two additional generators will be required at Chief Joseph and two at The Dalles. These four units will cost about $23 million.

Will the arrangements with British Columbia require new legislation?

We don't think so. There are no international boundary situations such as the St. Lawrence Seaway, or the Libby project in Montana where a dam in the United States will back water into Canada. Our legal staff is working with lawyers in British Columbia on this and related matters.

Is the Mica Creek project different in any important manner from storage projects in the United States?

Yes—particularly with regard to conflicts with other interests. The Mica Creek reservoir will not flood towns, railroads, mining properties or tillable lands. It has no fish or wildlife problems. There are no International Boundary problems and no controversy as to who will own the dam after it is constructed.

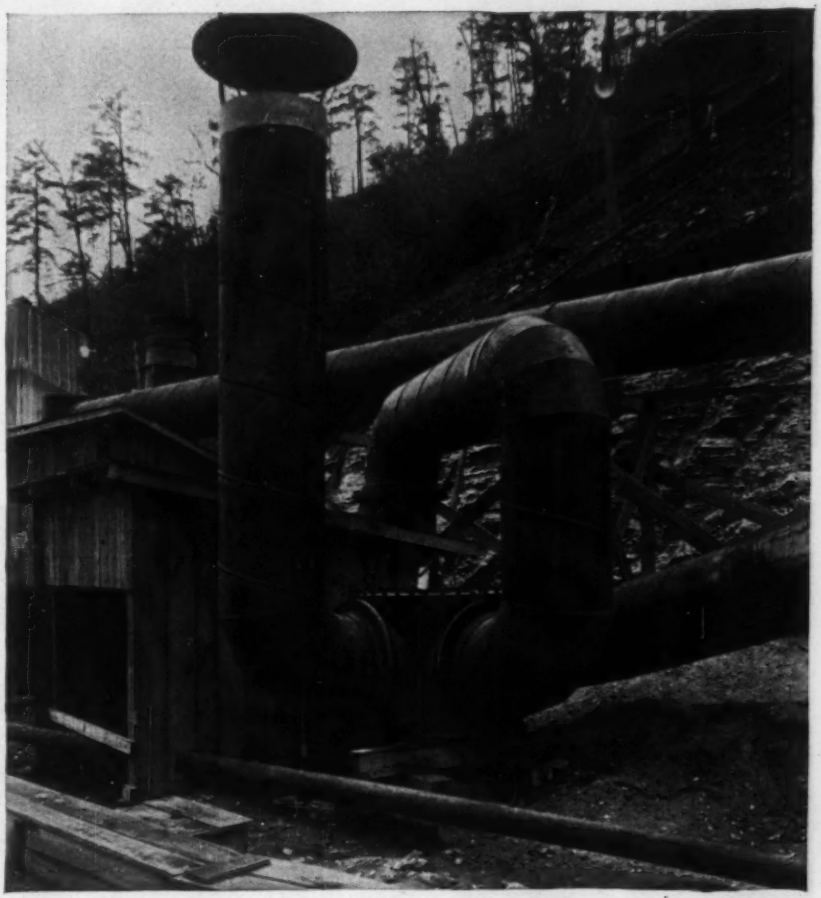
Do you have any definite commitments from the Canadians?

We have no firm commitments from the Canadians but we do have their assurance that they are intensely interested in our proposal and that they will cooperate fully in exploring its possibilities. This is quite a project and we all want to be sure of our facts. We are now exchanging technical data and legal opinions.

What other power potentials is the council studying?

We are negotiating a contract with the Atomic Energy Commission for the purpose of setting up a group of engineers to study nuclear reactor processes and their application to power production in the Pacific Northwest. We feel that ultimately nuclear power will be competitive with Northwest hydro and we want to be prepared to construct and operate that type of plant. In the meantime, we will be training a specialized staff.

MAN-MADE WEATHER for UNDERGROUND SERVICE



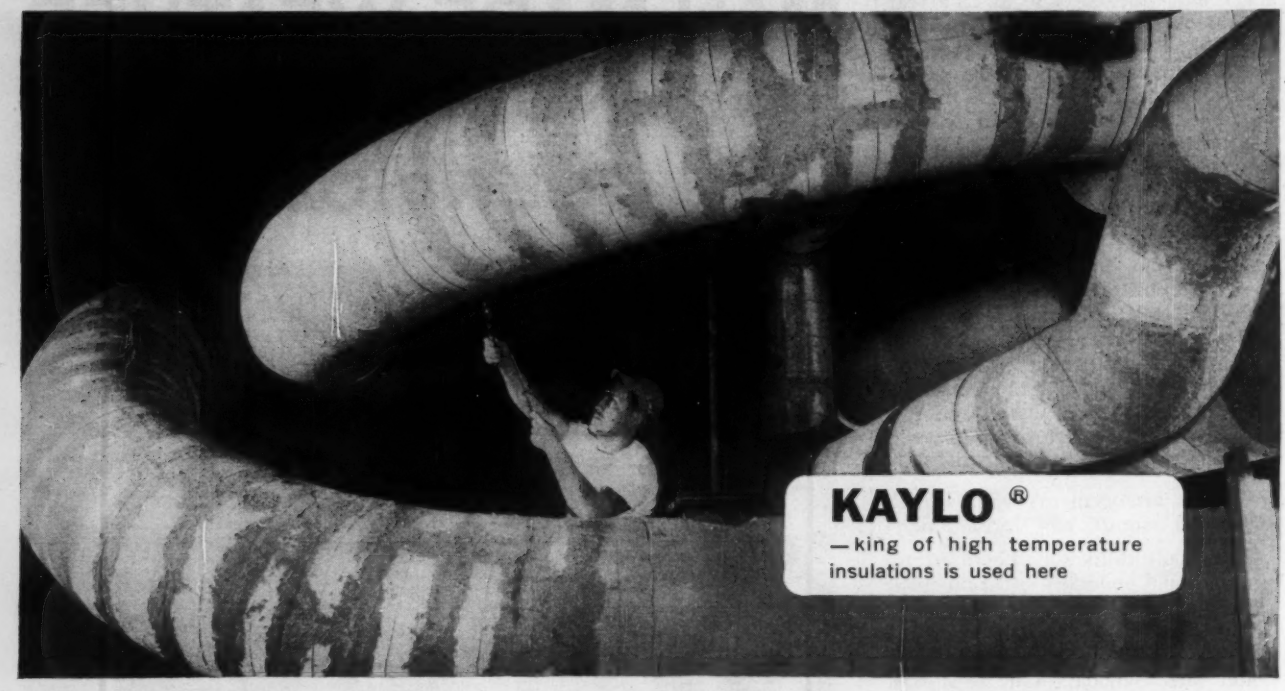
There's nothing more vital in underground construction than a dependable method for supplying fresh air and eliminating stale air, gases, fumes and dusts. That's where Naylor lightweight pipe comes in, providing the most dependable system for push-pull ventilation. Its light weight makes it easy to handle and install, particularly with the Naylor one-piece Wedge-Lock coupling to speed connection. Extra collapse strength and safety are assured through Naylor's exclusive lock-seamed spiralwelded structure which permits the use of lighter gauge steel without sacrificing strength. For full details on this outstanding pipe and coupling combination, write for Bulletins No. 507 and No. 514.

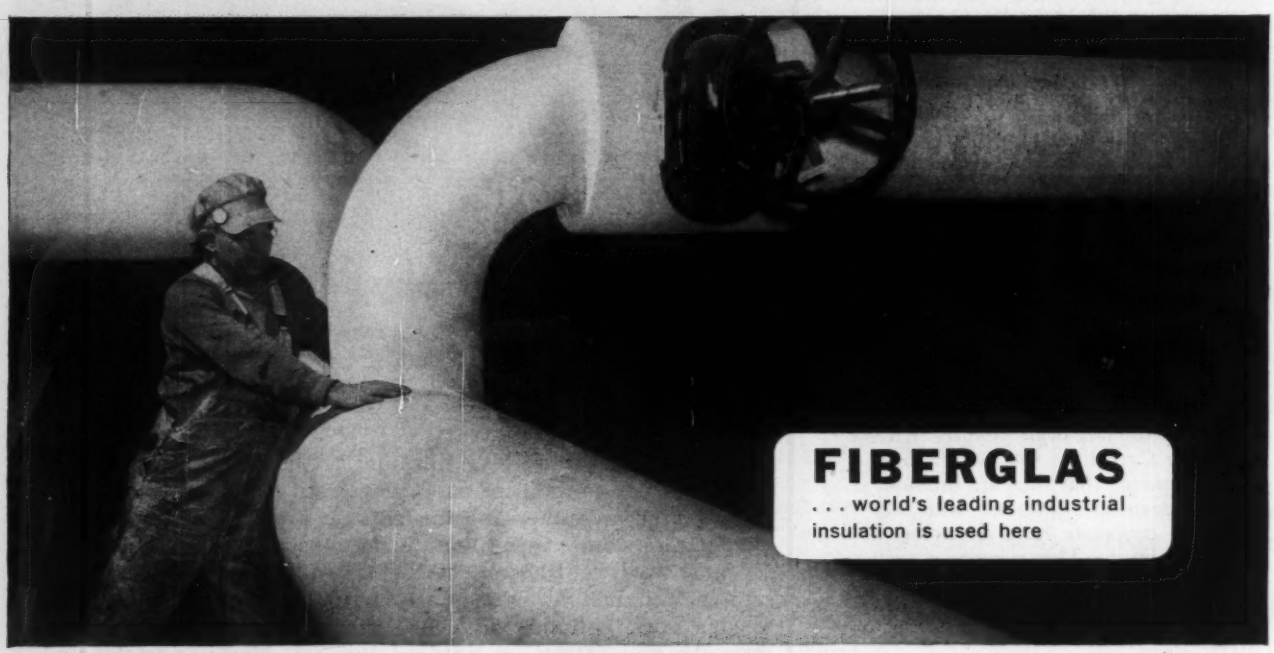
NAYLOR PIPE

NAYLOR PIPE COMPANY

1248 East 92nd Street, Chicago 19, Illinois

Eastern U. S. and Foreign Sales Office: 350 Madison Avenue, New York 17, New York





THEY ANSWER ALL YOUR INSULATION NEEDS!

Kaylo and Fiberglas* are outstanding in thermal efficiency. They offer the most complete and versatile line of plant insulations available, ranging from lowest sub-zero to 1200° F. They are exceptionally strong—moisture-resistant—dimensionally stable—light in weight and easy to apply. They can even be used again after removal for pipe inspection! (Kaylo is now distributed by Owens-Corning and is available in quantity.) For full technical data about Kaylo and Fiberglas insulations see Sweet's File, Chemical Engineering Catalog or Refinery Catalog. Or write: Owens-Corning Fiberglas Corporation, Dept. 145 A-20, Toledo 1, Ohio.

OWENS-CORNING
FIBERGLAS

*T.M. Reg. by Owens-Corning Fiberglas Corporation

WITHOUT dust collection equipment, silicosis-producing dust is free to escape into atmosphere and workers' lungs.

WITH exhaust system the dust is safely removed to hoppers in the machine to be emptied later into bags and buried.

Dustless Drilling: It's Faster, Cheaper, Safer

Within the space of a few miles on the western shore of the Hudson River, two rock drilling jobs are in progress simultaneously. One, in New Jersey, is marked by a low-lying column of dirty white dust. The air around the other in New York—on the Berlanti Construction Co.'s portion of the Thruway Project—is completely dust-free. The difference is made by a newly-designed rock dust collector that, besides being an approved method in New York for the prevention of silicosis, has shown by tests that it can help produce greater drilling footage with less sharpening of drill steel and consequently longer tool life.

The new machines are redesigned versions of those developed more than two decades ago by G. S. Kelly and G. J. Atwell (ENR March 1, 1934, p. 284). The basic principles have been maintained, but the modern versions have shorter wheelbases for greater maneuverability and lower heights for greater stability. New hopper-type bins make for easier discharge of accumulated material and an external shaker handle eases de-dusting of the filter bags. Also, a new type blower is used for more efficiency.

In principle, the dust collection machine is nothing more than an oversized vacuum cleaner, but the similarity ends with the principle. Starting at the hole, a protective hood around the drill steel shields the area for the accumulation of drilled rock dust and chips. From here it is sucked through hoses to the machine.

(*Continued on page 54*)

THESE COLLECTORS, flanking compressor, each handle dust from two drills. They are emptied through three outlets; one at front, two at sides of the machine.

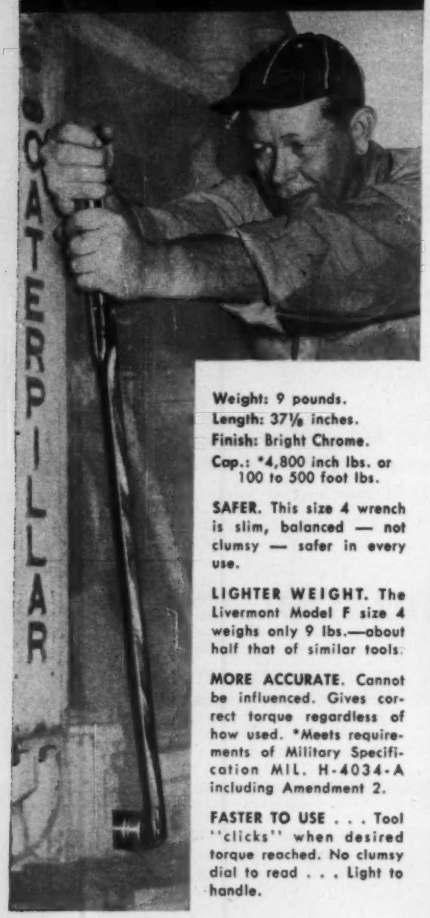
LIVERMONT

New Heavy Duty

TORQUE WRENCH

MODEL F - SIZE 4

- Safer
- Lighterweight
- More Accurate
- Faster to Use



Weight: 9 pounds.
Length: 37⅛ inches.
Finish: Bright Chrome.
Cap.: *4,800 inch lbs. or 100 to 500 foot lbs.

SAFER. This size 4 wrench is slim, balanced — not clumsy — safer in every use.

LIGHTER WEIGHT. The Livermont Model F size 4 weighs only 9 lbs.—about half that of similar tools.

MORE ACCURATE. Cannot be influenced. Gives correct torque regardless of how used. *Meets requirements of Military Specification MIL. H-4034-A including Amendment 2.

FASTER TO USE . . . Tool "clicks" when desired torque reached. No clumsy dial to read . . . Light to handle.

Use for steel bridge-and-building construction; bus and truck fleet maintenance; railroad repairs; oil field equipment maintenance; high line transmissions, etc.

Order today! 30-day money-back guarantee.

Write Dept. ENR for complete Richmont catalog on your company letterhead

$96.00

RICHMONT, INC.
"The Home of Torque"
922 SOUTH MYRTLE AVENUE
MONROVIA, CALIFORNIA

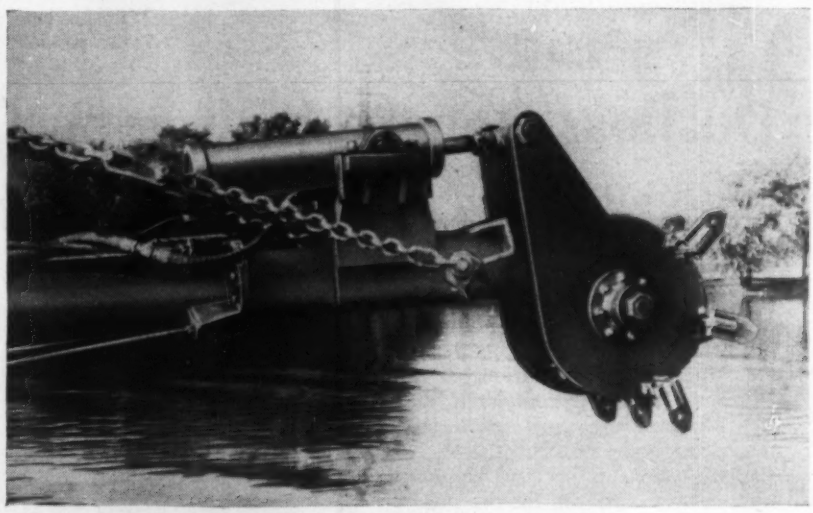
MANIFOLD connects leader with drill hose. Special hood is shown in foreground.

The machine is divided into two compartments. In the first, the velocity of the rock particles is slowed through a cyclone allowing heavier chips—which comprise about 98% of the total volume—to drop into an accumulator hopper. The particles that remain suspended enter the second compartment through two ducts at the top of the dividing partition.

Filtration in the second compartment is accomplished by a series of filter bags. Effectiveness of these filters is reported to be such that only particles measuring less than two microns in diameter are passed—some particles in cigarette smoke are larger than this.

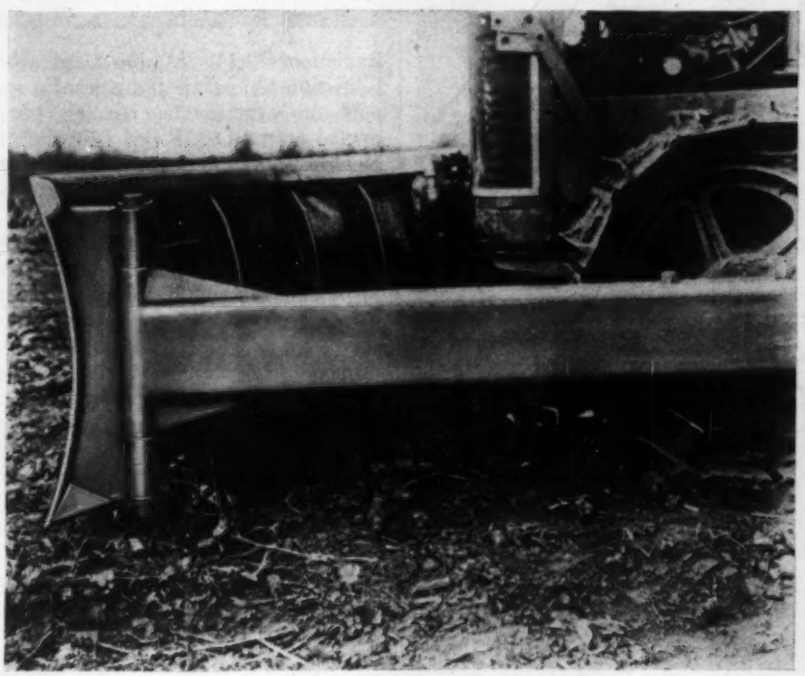
Power to drive the blower is supplied through V-belts from either gasoline or diesel engines or electric motors; individual horsepower is dependent on the size of the machine. The smallest of the dust collectors will control rock dust from two jack hammers or one wagon drill; the next size is adequate for four jack hammers or two wagon drills; while the largest size is built for use with 12 jack hammers or six wagon drills. Effective working range from hole to collector varies from 400 to 450 ft.

All sizes of the dust units have sufficient storage capacity for four hours of continuous operation. To unload, caps are removed from the hopper outlets and the accumulated material fed into paper bags. The shaker handle is oscillated at this time to clear the filter bags. KADCO CORP., 36-40 11TH ST., LONG ISLAND CITY 6, N. Y.



Agitator Aids Suction Dredge Action

A suction dredge agitator has been designed to increase dredging output, reduce down-time due to clogging of the nozzle and lower overall dredging costs. Known as the Agipeller, the device consists of an oscillating agitator activated by hydraulic power from the deck of the dredge. It eliminates the heavy weights, long shafting, bearings, couplings, chains and pins associated with conventional ladders. Rows of manganese steel teeth sweep back and forth in front of the suction nozzle, cutting and loosening compacted deposits, pushing aside large objects to keep the nozzle clear. Should tramp iron or other obstruction become wedged in the nozzle, the Agipeller automatically reverses itself to avoid damage. The Agipeller is recommended specifically for sand and gravel deposits which do not "cave" readily, or in loose deposits containing a large number of oversized stones that clog plain suction nozzles and their dredge pumps. The hydraulic pump of the power unit may be either directly connected to a motor, or run off a jack by V-belt drive. W. H. Pfarrer Co., 211 W. Wacker Dr., Chicago, Ill.



Angle Dozer Has New Hinge Mounting

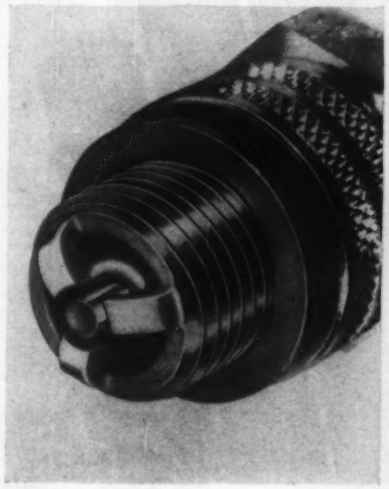
A new angle dozer is designed to eliminate the excessive overhang and weight of the older horseshoe construction and improve maneuverability. Using a more compact twin-corner-hinge system of blade attachment, the new dozer construction permits the blade to be anchored much nearer the crawler, thereby affording greater ease of control and blade effectiveness, it is claimed. In addition, the unit can be converted to tool-bar use, involving any pull-behind operation, by removing the dozer blade and turning the push-arms to the rear. The dozer uses twin, 4-in. two-way cylinders, front-mounted pump and a heavy-duty industrial valve with float position. It fits International-Harvester TD-6, TD-9, TD-14; Caterpillar D-2, D-4, D-6; Allis-Chalmers HD-5 and Oliver A, B, and D. Teale & Co., 1417 N. 57th St., Omaha.

Triple Electrode Spark Plug Said to Cut Fuel Consumption

A triple electrode spark plug with concave ground electrodes has been developed for use in gasoline powered construction equipment. It is claimed that Auburn TC-3 can be used in all automotive engines to gain four definite advantages: lower fuel consumption, more power, less plug fouling and easy cleaning. In addition to triple electrodes, the TC-3 also adapts the solid copper gasket and 95% aluminum oxide insulator used in jet engine plugs.

The three gaps are factory set. If one electrode burns or erodes away beyond the most efficient gap setting, it is said that the other two remain properly set to make sure of complete combustion and plug life is thereby doubled. Turbulence of the fuel mixture around the three electrodes and through the open gaps allegedly minimizes lead fouling and cools the nose of the plug.

In field tests of the plug made by operators, fuel savings up to 40 per cent have been reported along with increased acceleration and power. The Auburn TC-3 is manufactured in sizes to fit all gasoline engines. Auburn Spark Plug Co., Auburn 3, N. Y.



CUTS COST IN DRILLING ANY MASONRY MATERIAL

Choose from the only COMPLETE LINE. Cyclo-twist and Cyclo-Core for Rotary Drilling — Thunder-twist and Thunder-Core for Hammer Drilling. Drill ANY KIND OF MASONRY, soft, medium, hard or abrasive; ANY SIZE OF HOLE from ⅛" to 6"; ANY DEPTH OF HOLE UP TO 36"; for ANY TYPE OF DRILL, Electric Rotary Drill or Power Hammer. DO THE JOB QUICKER, EASIER AND MORE ECONOMICALLY.

SEND TODAY FOR YOUR *FREE* "What and How" Manual of Masonry Drilling. Helps you to choose the right bit for every job.

New England
CARBIDE TOOL CO., INC.
60W Brookline Street, Cambridge 39, Mass.
Please send me my *FREE* "What and How" Manual.

NAME _____
STREET _____
CITY _____ STATE _____
COMPANY _____

NO BLOBBING, NO FEATHERING, NO FADE OUT

New, Improved Arkwright Tracing Cloths assure architects, engineers, draftsmen and designers of full protection against these three, ruinous, gremlins of the drawing board.

The result of continuous research, the new improved Arkwright tracing cloths give you greater transparency and the finest working surface. Your drawings will always have a clear, ageless permanency as Arkwright guards them from the ravages of time and the eraser.

Write for free samples! See for yourself, the improvements in the brand known as "America's Standard". Be sure that you use the rolls with the blue line. Arkwright Finishing Co., Industrial Trust Building, Providence, Rhode Island.

ARKWRIGHT
Tracing Cloths
AMERICA'S STANDARD FOR OVER 33 YEARS

PUBLICATIONS

Radiation shield—"Marble Used as a Radiation Shield" is the title of a report on experiments recently conducted at the Oak Ridge Institute of Nuclear Studies to determine the most effective and most economical protection against high voltage radiations. Twenty-six diagrams, charts and illustrations dominate this 32-page book to provide the architectural profession with a summary of the problems involved in, and the results obtained by using various methods and materials for shielding. Diagrams, room protection charts and tables show the shielding qualities of various thicknesses of marble at points 3 ft, 7½ ft, and 12 ft from source of radiation. MARBLE INSTITUTE OF AMERICA, 108 FORSTER AVE., MT. VERNON, N. Y.

Scaffolding—The Brainard scaffolding system is described in a new 12-page bulletin recently released. The bulletin shows the principle of assembly, using a patented slip-fit arrangement that eliminates nuts, bolts, pins, or tools. Various applications are illustrated. BRAINARD STEEL DIV., GRISWOLD ST., WARREN, OHIO.

Maple flooring—A research report entitled "Controlling Expansion of Hard Maple Floors," is designed to provide architects and builders with data that will give a better understanding of important factors influencing the stability and general serviceability of hard maple floors. The information, developed through extensive research conducted for the Association in the Timber Engineering Co. laboratory shows how to control expansion of hard maple floors and allowances to be made for expansion. Emphasis is placed on the importance of proper nailing. Single copies of the illustrated 8-page report are available upon request. MAPLE FLOORING MFRS. ASSN., SUITE 548, PURE OIL BLDG., CHICAGO 1, ILL.

Hack saw blades—A small booklet of 30 pages describes the proper technique for selecting and using hack saw blades. The booklet is divided into four parts including an introduction and information on hand blades, light power blades and heavy power blades. A brief section gives the advantages of using eclipse blades. JAMES NEILL & CO. LTD., 44 WHITEHALL ST., NEW YORK 4, N. Y.

Street lighting—Technical data on lamps for street and highway lighting is given in a new 8-page booklet. De-

signed as a selection guide, the booklet gives information on all lamps in common use as well as others recommended for this type of service. Four charts present data on mercury lamps, and series and multiple type lamps, both for standard service and group replacement. The data include such information as mean lumens, lumens per watt, initial lumens, and physical dimensions. A graph of typical lumen maintenance curves for series and multiple type lamps is also presented. Booklet S-413. LAMP DIVISION, WESTINGHOUSE ELEC. CORP., MACARTHUR AVE., BLOOMFIELD, N. J.

Product catalog—The "Quick Reference Guide" is an illustrated 24-page booklet of interest to those concerned with problems of building maintenance and construction. A number of Tremco products are described and various maintenance problems of roofs, floors, sash, masonry preservation, etc., are discussed. More than 50 photographs and drawings illustrate a range of topics such as flashing and coping repair, installation of mastic flooring, caulking and pointing, glazing and painting. THE TREMCO MFG. CO., 8701 KINSMAN RD., CLEVELAND 4, OHIO.

Lightweight concrete — "Permalite Concrete Roof Deck Specification Manual" is the title of a working handbook on lightweight insulating fireproof concrete for roof deck construction. The Manual contains 218 pages and is divided into two sections—structural and non-structural. Tables have been worked out in detail so that an architect planning to use a certain type of construction, on a given joist spacing, with a particular type of ceiling below, has only to turn to the proper table and find, already worked out, the slab thickness required with different Permalite concrete mix ratios, the strength and the K or U factors for the whole roof ceiling combination. A division gives subpurlin details and load tables to supplement other material in a section on insulating roof fill. GREAT LAKES CARBON CORP., PERLITE DIV., 612 S. FLOWER ST., LOS ANGELES 17, CALIF.

Power take-off—A new power take-off drive is described in Bulletin No. 542. This drive, consisting of a 1¼-in. flexible shaft in combination with a square telescopic rod and tube, does away with power couplers. It is being used on dump trailers. STOW MFG. CO., 906 SHEAR ST., BINGHAMTON, N. Y.

FIGURE FACTS from *Ramset* PROFIT ENGINEERS

PROFIT ENGINEERING HELPS JOHNS-MANVILLE SAVE 103 DAYS...ADDS $2,400 PROFIT MARGIN

To install acoustical ceilings and walls for the Ohio Oil Company at Findlay, Ohio, required setting 11,000 eye pins in concrete. Johns-Manville used RAMSET SYSTEM, at the rate of 100 fastenings per hour, instead of 12 with old-fashioned methods. Result — costs were reduced by $2,400 and the work completed far faster than originally anticipated.

***Ramset* features**
INCREASE EASE AND EFFICIENCY

The compact, lightweight RAMSET JOBMASTER made light work of overhead fastening. One-hand, trigger operation was easy from scaffolds and ladders. Pin-point accuracy of Roto-Set Shield and Tru-Set Fasteners resulted in close-to-perfect performance with ample holding power.

FIGURE EVERY JOB WITH *Ramset* TO INCREASE YOUR PROFIT MARGINS

General contractors find it profitable to see that subcontractors use RAMSET SYSTEM, to get the lowest possible estimates and to meet competitive bidding. Your nearby RAMSET dealer will give you on-your-job *Profit-Engineering* service for projects under way or in the planning stages. Write for booklet, *Modern Fastening Methods* and for detailed drawings and specifications for your anchoring work.

***Ramset Fasteners*, INC.**
RAMSET DIVISION • OLIN MATHIESON CHEMICAL CORPORATION
12107 BEREA ROAD • CLEVELAND 11, OHIO

Pick up one in every doorway!

You can save up to $100 on every single door opening you fill with a Fenestra* Hollow Metal Door!

There are four sound reasons why these Door-Frame-Hardware units can give you such important savings:

1. *They cost less to buy* because you get production-line economy—not custom job costs. They are mass produced on special jigs that avoid expensive time and labor.

2. *You save time*—they come to your job complete with pre-fitted door, frame and hardware specifically made for each other. You eliminate planning, ordering and assembling special elements.

3. *You save on installation costs* because these complete units need no cutting, no fitting, no mortising or tapping. Each door is installed and in use in minutes.

4. *You save year after year on maintenance* because Fenestra Hollow Metal Doors can't warp, swell, stick or splinter. They always open easily, smoothly. They close quietly because inside surfaces are covered with sound-deadening material.

There's a door for every purpose in the Fenestra line: Entrance Doors, Flush or Regular Interior Doors with glass or metal panels, Doors with the Underwriters' B Label. For photos and details, write the Detroit Steel Products Company, Dept. ER-1, 2286 E. Grand Blvd., Detroit 11, Michigan.

*®

Fenestra | DOOR • FRAME • HARDWARE UNITS

Architectural, Residential and Industrial Windows • Metal Building Panels • Electrifloor* • Roof Deck • Hollow Metal Swing and Slide Doors

Education Society Elects Prof. William L. Collins

William L. Collins, engineering professor at the University of Illinois, has been elected executive secretary of the American Society for Engineering Education. He succeeds Arthur Brownell, recently resigned from Northwestern University to become president of Worcester Polytechnic Institute.

Professor Collins graduated from the University of Illinois and holds both a bachelor's and master's degree in civil engineering. He has been on the faculty since 1929 and teaches theoretical and applied mechanics.

As a result of his appointment, ASEE's central office is being moved to the Illinois campus. The society, organized in 1893, now has a membership of 8,000.

Public Works Directorship Changes Hands in Ohio

Zoyd M. Flaler, a veteran of Ohio state engineering work, last week became public works director. He was appointed by Gov. Lausche to succeed Clyde L. Moyer, who retired after 45 years of public service.

This is Moyer's second retirement. In 1949, he left the highway department with which he had been for 33 years, serving as division engineer of bridges and planning engineer. Shortly afterwards, he was named to the Reclamation Board of Review and in 1952 took over the public works directorship.

Flaler, a graduate of Wayne Business College and a civil engineering graduate of Tri-State College, was formerly chief of the reclamation division. Earlier in his career he was a construction engineer for General Electric, Mercer County engineer, and service director and city engineer for Coldwater, Ohio.

George S. Bartlett Award Goes to J. A. Anderson

James A. Anderson, head of the Virginia Highway Department, was recipient of the George S. Bartlett Award at the annual meeting of the Highway Research Board in Washington last week. The award was set up in 1931 in honor of Mr. Bartlett, a pioneer in the development of better highways. Sponsors, in addition to the HRB, are the American Association of State Highway Officials and the American Road Builders Assn.

The Bartlett Plaque, highest award in the highway field, goes to Mr. Anderson in recognition of the road modernization program he has carried out in Virignia since he was named commissioner in 1941.

The Highway Research Board's annual award for the best technical paper at the previous annual meeting went to Claude A. Rothrock, an engineer of the State Road Commission of West Virginia. His paper, "Urban Congestion-Index Principles," was a discussion of the need for an objective method for measuring and evaluating traffic congestion.

Roy W. Crum Awards for distinguished service, set up in 1952 in honor of the late director of the Highway Research Board, went to three men this year: Burton W. Marsh, director of the traffic engineering and safety department of the American Automobile Assn.; Ralph Moyer, research engineer of the Institute of Transportation and Traffic Engineering at the University of California, and the late Walter H. Root, deputy chief engineer of the Iowa State Highway Department. Mr. Root was serving as chairman of the Highway Research Board at the time of his death last April. The other two have served the board in the same capacity in the past.

Men and Jobs Briefs . . .

• **Careers**—The Oklahoma Turnpike Authority promotes **W. D. Hoback** to chief engineer and manager—he succeeds **H. E. Bailey**, retiring manager who joins Deleuw Cather Co., Chicago . . . **Holden A. Evans, Jr.**, becomes general manager of the New York State Thruway Authority . . . **H. E. Lewis** is appointed chief highway engineer, Florida State Road Department . . . **Dwight P. Miller** is named chief of the Ohio division of Reclamation.

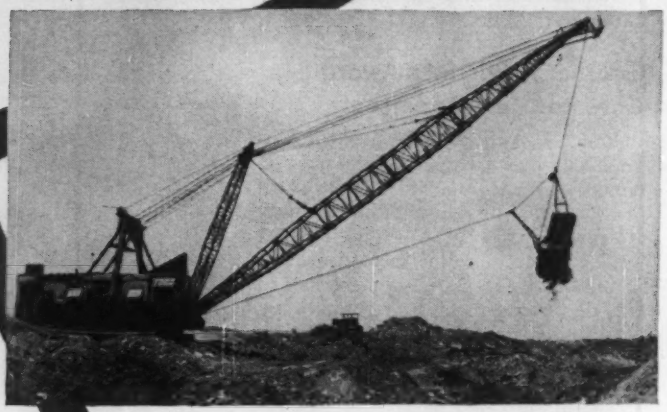
• **Associations**—New director of research of National Clay Pipe Research Corp. is **Albert J. Reed**, senior research engineer of The Carborundum Co. . . . **William Gillett** succeeds **E. C. Spratt** as president of the Producers' Council—he's president of Detroit Steel Products Co. . . . **Richard E. Heartz**, president of Shawinigan Engineering Co. Ltd., Montreal, is elected president of the Engineering Institute of Canada, succeeding **D. M. Stephens.**

• **Retirements**—After 32 years of government service, **Percy A. Sigler**, from the National Bureau of Standards where he specialized in flooring materials research . . . **Jeffrey A. Stone**, as manager of the Philadelphia office of Mahony-Troast Construction Co.—he'll continue in an advisory capacity.

Crane and Shovel Executive

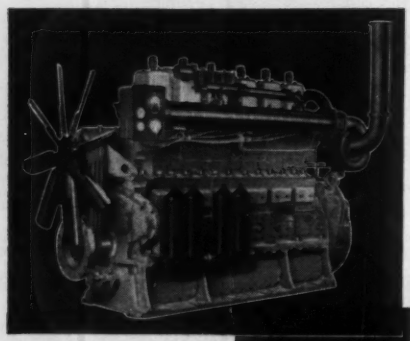
Walter W. Walb, president and general manager of American Steel Dredge Co., Inc., has been elected president of the Power Crane and Shovel Association. He succeeds Julian Steelman, president of Koehring Company, Milwaukee. The Wayne Crane Division of American Steel Dredge Co. is one of 15 members of the association, representing a large proportion of the shovel and crane industry's productive capacity.

EXTRA HP at lowest fuel cost!



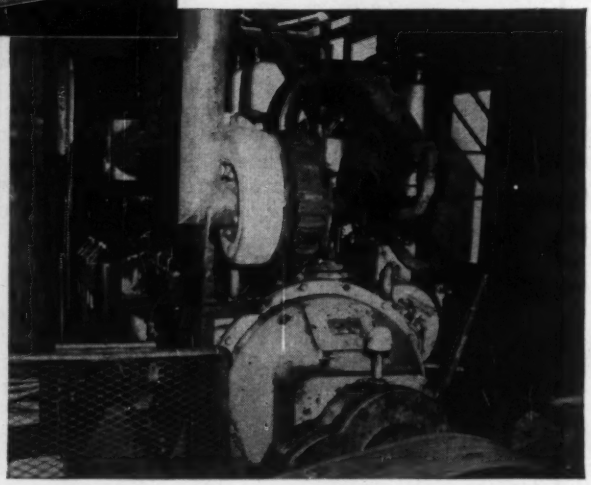
Penbrook Contracting Corp., Camp Hill, Pa., use this Waukesha Turbocharged 2894 cu. in. Diesel powered 5W Bucyrus-Monighan drag line with 6-yd. heavy-duty bucket and 125′ boom for coal stripping and excavating.

turbocharged WAUKESHA Diesels



Mr. William E. Crum, President, Penbrook Contracting Corp. says: "One of the best engines we have ever owned." Outstanding characteristics of this big turbocharged Waukesha LRDBS Diesel are lively acceleration, clean burning, prompt starting, a tremendous reserve of power and great overall economy. Send for Bulletin 1606. 259

Turbo-Supercharged Waukesha LRDBS Diesel (*above and right*)—2894 cu. in., 8½-in. bore and stroke; develops 570 hp max. at 1200 rpm; burns all standard "high speed fuels"—powers drag line (top) owned by Penbrook Contracting Corp.



WAUKESHA ENGINES and POWER UNITS 10 hp to 1100 hp

WAUKESHA MOTOR COMPANY
Waukesha, Wisconsin
New York • Tulsa • Los Angeles

OBITUARIES

Alan M. Ferebee, 72, the engineer who was in charge of building the Marine Corps Air Station at Cherry Point, N. C., died in Morehead City, N. C., Jan. 1. He was formerly vice-president and director of the Foundation Co. (foreign) and district manager of the domestic company. Before retirement he was affiliated with the engineering firm of Carr & Greiner, of Durham, N. C., and Baltimore, Md.

Charles W. Donaldson, 66, construction superintendent with George A. Fuller Co., New York City, died Dec. 13 in Newark, N. J. Among the buildings he helped erect were the Polish Pavilion at the 1939 New York World's Fair and the Dodge Chicago plant.

Wallace C. Lyon, 91, former Treasury Department structural engineer who designed many of the big federal money vaults, died in Hyattsville, Md., Dec. 28. He designed vaults for the Bureau of Engraving and Printing, and Treasury Department.

Arthur L. Bush, 70, city engineer of Albany, N. Y., since 1946, died Dec. 31. He joined the New York state highway department in 1909, later served as senior assistant engineer and deputy superintendent in the Albany County highway department.

Arthur F. Hewitt, 71, former chief highway engineer for Colorado, died Dec. 4 in Denver. He joined the road department in 1929 and became chief engineer in 1944. Since leaving the chief's post he has been assistant bridge engineer for the department.

Horace V. Hubbell, 72, retired Bureau of Reclamation engineer, died Dec. 18 at Ft. Collins, Colo. One of his big jobs during 36 years bureau service was serving as engineer in charge of Angostura Dam near Hot Springs, S. D., the first irrigation unit in the Missouri Basin.

Francis L. Castleman, Jr., 52, dean of the school of engineering at the University of Connecticut since 1946, died at Storrs, Conn., Dec. 30. He was an authority in the field of structural engineering.

Harry A. Shuptrine, 67, for the past 35 years bridge engineer for the Wayne County Road Commission, Detroit, died Dec. 6. He had charge of design and construction of the Davison and John C. Lodge expressways.

LEGAL

Obligations of Contractors To Coordinate Their Work

Three contracts were awarded at the same time to three different contractors by a state building commission for the construction of different parts of the same building. Performance of each contract was limited to 300 days.

One contract was to furnish and install steel bookstacks. Another contractor was to install the plumbing and heating system, while the third contract was to erect the entire building except the work covered by the two other contracts and the electrical work.

Each of the three contracts provided that each contractor would coordinate his work with that of the other contractors so as to facilitate and expedite the completion of the building.

The general contractor brought an action against one of the other contractors to recover damages sustained by it from delays resulting from the failure of the other contractor to proceed with his part of the work so as to permit the general contractor to complete work within time stipulated in the contract, and obtained a recovery.[1]

A defense was interposed that the general contractor had no right of action against the other contractor, since the general contractor was not a party to the contract of the contractor that was being sued. The court held otherwise, stating in its opinion: "We think under the local law [Mississippi], that the contract in suit made the several contractors direct beneficiaries of the contractual provision that any contractor would be liable for any actual damage inflicted upon another contractor on this job because of the breach of any duty assumed under the contract. When to this is added the contractual obligation, upon due notice, to settle with such contractor by agreement or arbitration for the damage caused, the local law created the right of action or caused it to arise out of the facts."

However, in another recent case[2], the court held that the provisions in a government contract requiring the various contractors engaged on the same project to cooperate with one another was intended solely for the benefit of the government and did not give rise to a cause of action in favor of one contractor against another who allegedly had not extended cooperation.

It is to be noted that the determination in the first case above was based on a local statute.

In a third instance[3], the owner of

NEW . . . FOR YOU!

STANDARD ASPHALT PLANT CATALOG

16 money saving, idea-packed pages.
See the latest and best in asphalt plants. *Yours for the asking!*

Find out why hundreds of users throughout the nation say, "STANDARD is best—for production—for quality—for low operating and maintenance costs'." Write for your copy today.

STANDARD

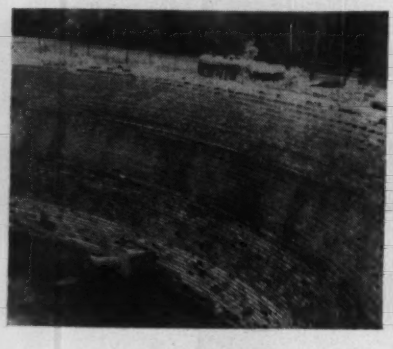
STANDARD 52 YEARS 1902 1954

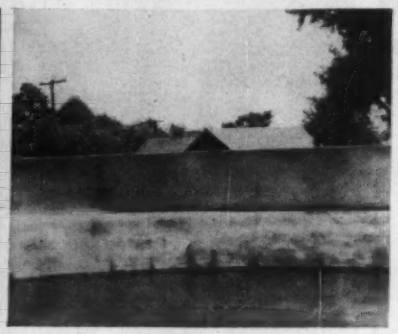
2-B

STANDARD STEEL CORPORATION

5093 Boyle Ave., Los Angeles 58 • 15 Park Row, New York 93

Note: **Our Vice President, M. B. Freeman, will attend the A.E.D. Convention, January 23 to 27 in Chicago. He will be at the Conrad Hilton Hotel.**





CEMENT GUN COMPANY SOLVES TWO RESERVOIR PROBLEMS WITH "GUNITE"

Photo at left shows crumbling condition of an 80' circular brick reservoir in a western Pennsylvania town. It was one of two such reservoirs owned by the municipality, the other being 50' in diameter. Both leaked badly and were too small to provide desired storage. Photo at right shows how the Cement Gun Company crew solved both problems by coating sides with "GUNITE" and extending the walls 6' in height with pre-stressed "GUNITE." Leakage, of course, was eliminated and the capacity of both reservoirs was increased more than 50%. This is just one of many examples of how the Cement Gun Company has been able to rebuild and reconstruct water storage structures to better-than-new condition and, at the same time, provide needed additional capacity.

For illustrations of other "GUNITE" jobs, ask on your letterhead for free copy of Bulletin A 3000 today.

CEMENT GUN COMPANY
"GUNITE" CONTRACTORS
GENERAL OFFICES – ALLENTOWN, PA., U. S. A.

MANUFACTURERS OF THE "CEMENT GUN"

Another Job Done Better With The ALL-NEW 'Jeep'®

"GO-ANYWHERE" TRANSPORTATION

Here's the vehicle that takes men and tools to the job when nothing else can—the all-new 4-Wheel-Drive 'Jeep'. With the extra traction of its 4-wheel-drive, the 'Jeep' goes through mud, sand, snow and roadless country . . . saves time when time counts most. It is good business to own the all-new 'Jeep' . . . and good insurance of getting through to the job every day in the year. Get all the facts about the all-new 'Jeep'.

WILLYS MOTORS, INC.
TOLEDO 1, OHIO

'JEEP' • 4-WHEEL-DRIVE TRUCK • 4-WHEEL-DRIVE STATION WAGON • 4-WHEEL-DRIVE PANEL DELIVERY

THE WORLD'S MOST USEFUL VEHICLES

a parcel of land let separate contracts for construction of a drive-in theater, one for grading and one for electrical work. In the course of the grading work, one of the machines destroyed wiring already installed by the electrical contractor. The latter brought suit to recover the damage sustained, and was allowed a recovery, the court held each contractor was independent but was bound to coordinate his work with that of the other contractor.

(1) M. M. Reed Const. Co. v. Virginia Metal Products Corp., 213 F. 2d 337, U. S. Court of Appeals, May 24, 1954.
(2) Brotherton et al. v. Merritt-Chapman & Scott Corp., 1 3 F.2d 477, U. S. Court of Appeals, June 2, 1954.
(3) Southwest General Const. Co. v. Price, 267 S.W. 2d 855, Court of Civil Appeals of Texas, March 26, 1954.

Extra Work Under a Contract

A construction contract contained the following provisions: "(1) The contractor is to furnish all the necessary labor and materials required to construct concrete foundations 10 in. thick, 7 ft. high, exclusive of excavation work except for footings only; foundation footings 8 in. thick, 18 in. wide; cellar floors; front stoop footings; and plastering of exterior foundation walls for 75 houses according to plans prepared by an architect.

Paragraph No. 2 of the contract provided that the owner shall pay the contractor for the performance of the contract at the rate of $375 per house upon condition that such rate should be applicable only to work ordered and commenced within 90 days after the making of the contract. The contract provided how the payments were to be made.

Paragraph No. 3 of the contract, designated "Extra Work", provided as follows: "Extra foundation work to be paid for at the rate of 28 cents per cubic foot for 12-in. walls; sidewalks 4 in. thick to be paid for at the rate of 14 cents per square foot; curbing to be paid for at the rate of 35 cents per lineal foot; payment for said extra work to be made within 30 days after completion of each item."

The contractor brought an action to foreclose a mechanic's lien for an amount allegedly due under the contract and for damages for breach of contract for refusal of the owner to do all the work called for for the 75 houses. The owner counterclaimed for damages for alleged breach of contract on the part of the contractor, claiming he refused to permit the contractor to complete the work because the contractor refused to lay the sidewalks and curbing called for by the contract, pursuant to paragraph No. 3.

The contractor moved to have the owner's counterclaim dismissed on the ground there was no agreement on the

part of the contractor "to proceed with so-called extra work, and hence the agreement with respect to the payment therefor was without mutuality and hence without consideration."

The trial court refused the contractor's application,[1] holding the paragraph in the contract entitled "Extra Work," cannot be disassociated from the balance of the contract and that on the contrary, a more reasonable construction of the contract would be that sidewalks and curbing as well as extra foundations might be required and if so required would be installed by the contractor at the price fixed in the contract."

The court further stated: "The distinction between 'extra work' and 'additional' work is often not easy to draw. Additional work is usually work which results from a change or alteration in the plans concerning work which has been done under the contract, while extra work relates to work which is not included within the contract itself. Of course, a contract may provide both with respect to additional work caused by alterations or changes and for extra work. Fetterolf v. S. & L. Construction Co., 175 App. Div. 177, 161 N.Y.S. 549; Shields v. City of New York, 84 App. Div. 502, 82 N.Y.S. 1020."

The determination of the lower court was reversed by the Appellate Division[2], that court holding the contract contained no provision requiring the contractor to install the curbs and lay the sidewalks. "It merely sets forth an agreed price for such services under the caption 'extra work'. That this term was employed with its ordinary meaning as work independent of the contract and not required in its performance (Shields v. City of New York, 84 App. Div. 502, 82 N.Y.S. 1020; Fetterolf v. S. & L. Construction Co., 175 App. Div. 177, 179, 161 N.Y.S. 649) is evident from the fact that these items are not included in the 'Scope of Work' provision of the contract."

The Court of Apeals[3] reversed the determination of the Appellate Division and affirmed the decision of the lower court, holding; "In our opinion the provisions of the contract fixing the price to be paid for items as 'extra work' clearly implies an obligation to do such extra work at the stipulated price as required in connection with the performance of the work included in the 'Scope of the Work' as described in the contract."

(1) De Martini v. Elade Realty Corp., 52 N.Y.S. 2d 487.
(2) De Martini v. Elade Realty Corp., 45 N.Y.S. 2d 355, 267 App. Div. 773.
(3) De Martini v. Elade Realty Corp., 293 N.Y. 778, 58 N.E. 2d 519.

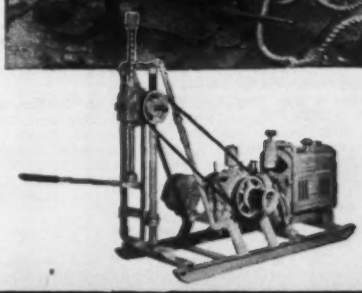
acker Portable, Power Operated Soil Sampling Rigs

Acker power operated soil sampling rigs combine into a compact, portable unit a standard power plant together with powerful hoisting winch and pump. Two models are available — Acker Model RGT for light duty and Acker RG for heavy duty service. These relatively inexpensive units are ideal for soil sampling, jetting and driving pipes or piles.

More for Your Money!

Add an *Acker rotary drill head* for rock coring and foundation test boring.

The Acker Model SK rotary drill head when combined with Acker RGT and RG rigs make an ideal unit for rock coring and foundation test boring. For complete information, write today for bulletin *28-ENR.*



ACKER DRILL CO., INC.
725 W. Lackawanna Avenue
Scranton, Penna.

A complete line of Soil Sampling Tools, Diamond and Shot Core Drills, Drilling Accessories and Equipment.

The Completely NEW More Rugged-Than-Ever 'Jeep'®

MODEL CJ-5

NEW, fully-boxed, front cross-member adds to the carrying strength, rigidity and rugged endurance of the frame.

NEW, sturdier body design with sheet metal flanged and overlapped for extra strength . . . center mounted to relieve road strain and for even greater sturdiness.

NEW, larger windshield has approximately 100 sq. in. of additional glass area and folds on stronger hinges. New streamlined hood offers increased visibility.

NEW, softer front seating is form fitting, bucket design with coil springing and gives a more comfortable ride.

Ask your 'Jeep' dealer for a demonstration.

WILLYS MOTORS, INC.
TOLEDO 1, OHIO

'JEEP' • 4-WHEEL-DRIVE TRUCK • 4-WHEEL-DRIVE STATION WAGON • 4-WHEEL-DRIVE PANEL DELIVERY

THE WORLD'S MOST USEFUL VEHICLES

Bids Asked—Low Bidders—Contracts Awarded—First Section—

Compiled by Business News Department—Engineering News-Record, 330 W. 42nd St., New York 36, N. Y., ELSIE EAVES, Manager
J. A. MAHONEY, M. O. WETZEL, L. M. WINISKI, M. E. SCIORRA, F. S. DEMBEK, Reports.
J. H. WEBBER, M. R. ROESSLER, E. R. HUBER, Statistics.

NEW ENGLAND

BIDS ASKED—BUILDINGS

Mass., Seekonk—SCHOOL—BA 1/27—Town, Junior High School Bldg. Comn., James A. Thompson, chn., c/o Supt. Schools, Junior High School, off Newman Ave. $850,000. Plans deposit $50. Rich & Tucker Assoc., 45 Newbury St., Boston, archts. CD 11/3, under LB.

▲ **Mass., Cambridge**—SCHOOL—BA 2/7—City, School Dpt., 1700 Cambridge St., Ellis-Sleeper-Wyman Elementary School, Ringe Ave. and Haskell St. $1,200,000. M. A. Dyer Co., 24 School St., Boston, archt. CD 3/24.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲† **T. C. Bateson Constr. Co.**, 6800 Denton Rd., Dallas, Tex., LB $2,738,150, nine hangars, ENG-19-016-55-62, Portsmouth Air Force Base, PORTSMOUTH, N. H. U. S. Eng., 857 Commonwealth Ave., Boston, Mass. Bids Jan. 7. CD 12/21.

Pascella Bros. Corp., 247 Washington St., Dedham, Mass. LB $924,090, est. $900,000. No. 558, Sect. C, East Street Branch Interceptor, Roosevelt Ave. Branch Interceptor and Mill St. Branch Interceptor, Blackstone Valley Sewer Dist. Comm. at Central Falls, PROVIDENCE, R. I. State of R. I. and Providence Plantations, F. A. Adams, purch agt., State House, Providence, R. I. Bids Jan. 6. CD 12/21.

▲ **MASSACHUSETTS**—Massachusetts Turnpike Auth., 80 Boylston St., Boston,
Nello L. Teer Co., Durham, N. C. LB $4,306,729. Contr. 51-070. hy. and bridges Charlton, Oxford and Auburn. Bids Jan. 5. CD 12/15.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Girdler Co.**, 244 E. Broadway, Louisville 1, Ky. CA Est. $9,000,000. anhydrous ammonia PLANT for fertilizer, SEARSPORT, ME. Northern Chemical Industries, Inc., Searsport, Me.

Dr. William Lemscher, Compo Rd., Westport, Conn. Owner Builds. $600,000, SHOPPING CENTER, incl. 8 stores with offices, 66 North Main St., WESTPORT, CONN. Robert I. Carter, 47 Main St., Essex, Conn., archt.

MIDDLE ATLANTIC

SOON LETS CONTRACT—BUILDINGS

N. Y., Syracuse — DORMITORY — Syracuse University, Admin. Bldg., soon lets contract 2 units, 2 4-story, 40x200 ft., one 1-story brick, concrete, steel women's dormitory, Mount Olympus, $900,000. Harry A. & F. Curtis King, 322 S. Warren St., archts.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **NEW JERSEY**—New Jersey Turnpike Auth., Administration Bldg., New Brunswick,
Bethlehem Steel Corp., 25 Broadway, New York, N. Y., CA $3,247,045, Contract N.-14, steel superstructure and concrete deck for South East Viaduct, extending from Ave. E. Interchange to vicinity of Brown Pl., Jersey City, Newark Bay-Hudson County Extension of New Jersey Turnpike, Hudson Co. Bids Dec. 7. CD 12/13, under LB.

NEW JERSEY—New Jersey Turnpike Auth., Administration Bldg., New Brunswick,
Harris Structural Steel Co., 419 Fourth Ave., New York 10, N. Y., LB $769,845, Contract N-20, superstructure steel for Bayview Viaduct extending from Caven Point Rd. Interchange to Bayview Ave. in Jersey City in connection with constr. of Newark Bay-Hudson Co. Extension of New Jersey Turnpike, Hudson Co. Bids Jan. 6. CD 12/9.

▲ **NEW JERSEY**—New Jersey Turnpike Auth., Administration Bldg., New Brunswick,
Horn Constr. Co., 2174 Hewlett Ave., Merrick, L. I., N. Y. CA $1,183,030, Contract N.-13, abutments and piers for connecting ramp, etc. for southwest viaduct extending from Avenue E. Interchange to vicinity of Brown Pl., Jersey City, Hudson Co.;
Baldwin-Lima-Hamilton Corp., Eddystone, Pa., CA $3,576,806, Contract N-22, fabrication, erection of superstructure, steelwork for East Viaduct extending from its west abutment just west of Communipaw Ave. to Pier 1 of West Viaduct north of Grant St. in Jersey City, Hudson Co. Bids Dec. 28, awarded Jan. 6. CD 12/30, under LB.

▲ **PENNSYLVANIA**—State Hy. Dpt., 506 North Office Bldg., Harrisburg,
Ben Constr. Co., 101 Hargrove St., Pittsburgh, Pa. LB $1,276,532, constr. 3,783 ft. Carson Street Ramp B, Penn Lincoln Parkway west in Pittsburgh and substructure for approach to Fort Pitt Bridge, T. R. 22—30—837, Allegheny Co. Bids Jan. 7. CD 12/13.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Mar-Mes Constr. Co., Inc.**, 271 North Ave., New Rochelle, N. Y., LB $1,734,200, Ellenville Central SCHOOL, ELLENVILLE, N. Y. Central School Dist. No. 2, Bd. Educ., Maple Ave., Ellenville, N. Y. Bids Jan. 5. CD 11/30.

▲ **Bernard Associates, Inc.**, 86-21 112 St., Richmond Hill, N. Y. CA Approx. $2,000,000, General HOSPITAL, Front St. between Beverly and Clarendon Rds., HEMPSTEAD, N. Y. Hempstead General Hospital, c/o Samuel Paul & Seymour Jarmul, archts., 89-51 164 St., Jamaica, N. Y. CD 12/29.

Joseph L. Muscarelle Ltd., 42 First St., Hackensack, N. J., CA $700,000, 6 story OFFICE, 240 South Harrison St., EAST ORANGE, N. J. Liberty Mutual Insurance Co., 10 Rockefeller Plaza, New York 20, N. Y. Emil A. Schmidlin, 586 Central Ave., East Orange, N. J., archt. CD 3/17.

▲ **Franklin Hills Homes**, c/o Percy S. Simon, archt., 362 Cedar Lane, Teaneck, N. J., Owner Builds, $1,200,000, 86 HOUSES, Ralph St., Baier Ave., Park St. and other streets, FRANKLIN TWP., N. J.

▲ **Denny Building Corp.**, 2627 Fidelity Phila. Trust Bldg., Phila., Pa. CA $5,000,000, 450-unit RESIDENTIAL DEVELOPMENT, Roosevelt Blvd. PHILA., PA. Normandy Development, c/o contractor.

L-D Building Co., P. O. Box 472, Latrobe, Pa., LB $519,900, general contract new elementary SCHOOL, Reynoldsville-Windslow Joint School Board, REYNOLDSVILLE, PA. Pa. Public School Bldg., Auth., 101 S. 25 St., Harrisburg, Pa. Bids Jan. 6. CD 12/3.

Irwin & Leighton, 1505 Race St., Phila., Pa., CA $600,000, RESTAURANT and parking area, WYNNEWOOD, PA. Stouffer Restaurant Corp., 1375 Euclid Ave., Cleveland, O. Dixon B. Kellogg, 112 Maidson Ave., Detroit, Mich., archt.

SOUTH

BIDS ASKED—BUILDINGS

▲ **Ga., Dublin**—SCHOOLS—BA 2/10—State School Bldg. Auth., 41 Exchange Pl. S.E., Atlanta, Brewton-Condor Elementary and High School, Wilkes Elementary School mechanical remodeling, Cadwell Elementary School addn., Dexter Elementary School addn. William J. J. Chase & Assocs., 502 Candler Bldg., Atlanta, archts., Consolidated Negro School (Millville area), Negro School (Fleming-Mary Grove Area), Consolidated Negro School (Brewton Area), Webb & Co., 763 Pine St., Macon, archts. Plans deposit $50 each.

▲ **Ga., Thomaston** — SCHOOLS — BA 2/17 — Georgia School Bldg. Auth., 41 Exchange Pl. S.E., Atlanta, Thomaston Training School for Negroes addn., CD 9/30/52; Lincoln Park Elementary School for Negroes, CD 2/13/52; Yatesville Elementary School for Negroes; Fellowship Elementary School for Negroes; addn. and mechanical remodeling to Yatesville Elementary and High School; addn. and mechanical remodeling to James R. Atwater Elementary and Junior High School; addn. and mechanical remodeling to John Thurston Elementary and Junior High School; addn. and mechanical remodeling to John B. Gordon Elementary and Junior High School addn. and mechanical remodeling to Rock Hill Elementary and Junior High School. Plans deposit $50 each. Charles W. Jenkins, 326 Healey Bldg., Atlanta, archt.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲† **J. Hilbert Sapp, Inc.**, P.O. Box 2053, Orlando, Fla., CA $2,618,831, apron paving and warm up pads, base maintenance hangar, deluge fire mains, chapel and 5 squadron operations bldg., Homestead Air Force Base, HOMESTEAD, FLA. U. S. Eng., 575 Riverside Ave., Jacksonville, Fla. Bids Nov. 23. CD 10/13.

† **Ivey Brothers Constr. Co., Inc.**, 3252 Peachtree Rd., Atlanta, Ga., CA $639,681, airmen's dormitories and bachelor officers' quarters, Palm Beach Air Force Base, No. 08-123-55-27, WEST PALM BEACH, FLA. U. S. Eng., P.O. Box 4970, Jacksonville, Fla. Bids Nov. 17. CD 10/8.

▲ **LOUISIANA**—State Hy. Dpt., Hy. Office Bldg., Baton Rouge,
Boh Brothers Constr. Co., 2400 Cypress St., New Orleans, La., CA $4,145,953, Industrial Canal Bridge over Inner Harbor Navigation Canal at North Claiborne Ave. in New Orleans, State Rt. 1, S. P. 46-02-02, Orleans Parish. Bids Nov. 3. CD 11/5, under LB.

MIDDLE WEST

BIDS ASKED—BUILDINGS

▲ **Ind., Indianapolis**—SCHOOL—BA 2/2—Washington Township School Bldg. Corp., Claude M. Warren, 711 Electric Bldg., 1 story, bsmnt., brick, rein.-con., Township High School, Proj. A. $1,100,000. Plans deposit $50. E. I. Brown Co., 701 Circle Tower, Zone 4, archt. CD 5/5.

▲ **Ill., Joliet**—ACADEMY—BA 2/3—Sisters of St. Francis, 373 Western Ave., girls academy and convent. $1,650,000. E. Brielmaier & Sons Co., 735 N. Water St., Milwaukee, Wis., archt. CD 10/19.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **Ferro Concrete Constr. Co.**, 203 W. 3 St., Cincinnati, O. LB, $1,700,916, power and service bldg., Mill Creek Sewage Works, CINCINNATI, O. City, City Hall, Cincinnati, O. Bids Dec. 28.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Dunbar Co.**, 8201 Cedar Ave., Cleveland 3, O., CA $1,000,000. four 1 story and three 2 story masonry STORES, approx. 10,000 sq. ft. total floor space, on Shaker Square, CLEVELAND, O. Shaker Square Co., 13124 Shaker Square, Cleveland 20, O. Small, Smith & Reeb, 1010 Euclid Ave., Cleveland 15, O., archts. Awarded Jan. 5.

▲ **Frank Messer & Sons, Inc.**, 4612 Paddock St., Cincinnati, O. LB $1,854,800. general constr. 180x200 ft. stone exterior Marshon Memorial AUDITORIUM, at Ohio State University, COLUMBUS, O. State Dpt. P. Wks., State Dpts. Bldg., Columbus, O. Bellman, Gillett & Richards, 518 Jefferson St., Toledo, O., archts. Bids Dec. 21.

▲ **Herlihy Mid-Continent Co.**, 135 S. La Salle St., Chicago 3, Ill., CA, $1,841,650, Parking GARAGE, Huron, Fairbanks, St. Clair and Superior Sts., CHICAGO, ILL. City, City Hall, Chicago, Ill. Bids Dec. 3. CD 12/17, under LB.

▲ **Owner**, c/o Louis R. Solomon, 61 W. Superior St., Chicago 10, Ill. Separate Contracts. $2,500,000. 18 story, 220-unit APARTMENT, 3440 Lakeshore Dr., CHICAGO, ILL. CD 11/12.

† **Keno Constr. Co.**, Box 37, Highland Park, Ill., CA, $879,700, INDUSTRIAL BLDGS., etc., Badger Ordnance Plant, ENG-47-55-3, BARABOO, WIS. U. S. Eng., 428 Federal Bldg., Milwaukee, Wis. Bids Dec. 22. CD 12/29, under LB.

▲ **Ralph Biernbaum**, 25 Exchange St., Rochester, N. Y. Owner Builds. $1,750,000. SHOPPING CENTER, 25 stores, US-131, GRAND RAPIDS, MICH.

(Continued on page 66)

PROJECTS COVERED

By Size

Construction projects here reported cover the United States and Canada, are of these minimum sizes or larger: water supply, earthwork, waterways $44,000; other public works $73,000; industrial buildings $93,000; other buildings $344,000. Also Foreign projects of $100,000 and more in size of interest to American contractors.

By Regions & Classes of Construction

(In order of Listing)

BIDS ASKED
LOW BIDDERS
CONTRACTS AWARDED

New England
Middle Atlantic
South
Middle West
West of Mississippi
Far West

PROPOSED WORK
Water Supply
Sewers, Waste Disposal
Bridges
Streets & Roads
Earthwork, Waterways
Public Buildings
Mass Housing
Commercial Buildings
Industrial Buildings
Unclassified

In These Stages

PROPOSED WORK: Before and including appointment of engineers or architects.
BIDS ASKED: BA (new announcements only). For full calendar, see also preceding issues.

LOW BIDDERS: LB On jobs below $500,000 in value all low bidder news will be the final reports published on the projects involved except where award is not made to the low bidder. In this case, a supplementary contract award report will be published.

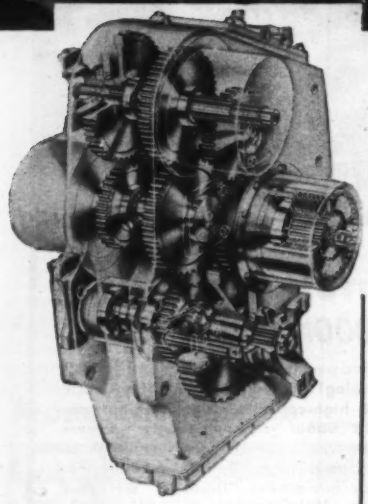
CONTRACTS AWARDED: CA Except awards to low bidders previously reported in low bidder stage.

CD dates shown are of Construction Daily issue in which last previous report was published.

Symbols and Abbreviations Include:

▲ Federal Government
ENR Project of $1,000,000 or over.
CD Engineering News-Record
† Construction Daily
For additional reports see Construction Daily.

Driver's left hand rests on power-shift levers—there's no clutch pedal



Here's the secret of
BIG TIME-SAVINGS:

the MICHIGAN Power-Shift Transmission! Forward-Reverse and High-Low gears are in constant mesh. Shifting is accomplished by hydraulic pressure. The power-shift levers on the steering column actuate control valves in the transmission. These valves direct oil pressure to the multiple disc-clutches, transmit engine power from the selected drive gears to the output shaft. Hydraulic oil completely lubricates all drive gears and bearings as it flows from top to bottom and returns to the sump through a fine-mesh screen.

You'll cut your loading time!

with the MICHIGAN Power-Shift Transmission

Operating a MICHIGAN Tractor Shovel is both fast and easy. Gone is the old-fashioned heavy duty foot clutch; gone is the tiresome work of clutching every time you shift gears.

The MICHIGAN Power-Shift Transmission does all the work for you. All you do is operate the finger-tip hand levers on the steering column . . . one for Forward-Reverse, the other for High-Low speed. Make either shift *while moving in either direction without coming to a stop.*

The MICHIGAN'S power-shift transmission speeds up operation, cuts loading time, gets you TOP YARDAGE per day.

Get a demonstration right on your own job. It is easily arranged: just phone your MICHIGAN distributor. Did you know MICHIGAN Tractor Shovels are available under the Clark Leasing Plan? We would be glad to send you full details.

CLARK EQUIPMENT

CLARK EQUIPMENT COMPANY
Construction Machinery Division
390 Second St., Benton Harbor 25, Michigan

- *Eliminate mechanical connection*
- *Utilize smaller, lower-cost motors*
- *Cushion out shock-loads*
- *Provide quick acceleration*
- *Balance compounded drives*
- *Transmit full input torque continuously*

with

FLUID DRIVES

If your powered equipment starts under load or has frequent running load variations, you can eliminate most maintenance problems with Twin Disc Fluid Couplings. For complete details on selecting and applying Fluid Couplings on motors or engines, ¾ to 850 hp, *write Twin Disc Clutch Company, Dept. DS, Racine, Wisc., today for new Bulletin 144-D.*

TWIN DISC
CLUTCHES AND HYDRAULIC DRIVES

TWIN DISC

TWIN DISC CLUTCH COMPANY, Racine, Wisconsin
Hydraulic Division, Rockford, Illinois

(Continued from page 64)

▲ **Practical Home Builders, Inc.,** 13440 W. Seven Mile Rd., Detroit, Mich. Owner Builds. **$1,400,000.** 130 single HOUSES, Fort Street area, RIVERVIEW, MICH.

Bert L. Smokler & Co., 1200 Penobscot Bldg., Detroit, Mich. Owner Builds. **$540,000.** sixty-two 1 story DWELLINGS, Thorncroft, Millard and Sunnybrook Sts., ROYAL OAK, MICH.

WEST OF MISSISSIPPI

BIDS ASKED—HEAVY CONSTRUCTION

† **Tex., Sherman**—READINESS CREW BLDG., etc.—BA 1/31—U. S. Eng., P.O. Box 61, Tulsa 2, Okla., readiness crew bldg. and ready rocket storage bldg., readiness (operation maintenance) hangar with shops, Perrin Air Force Base, Inv. No. ENG-34-066-55-45. $300,000-$750,000. CD 9/11/53.

† **Ark., Blytheville**—PARACHUTE, etc.—BA 2/17—U. S. Eng., P.O. Box 867, Little Rock, remodeling and addn. to parachute and dinghy bldg. and communications bldg., Blytheville Air Force Base, ENG-03-050-55-72, $100,000-$500,000. CD 12/1/53.

BIDS ASKED—BUILDINGS

▲ **N. M., Albuquerque**—DORMITORY—BA 3/1—University of New Mexico, Bd. Regents, Albuquerque, first phase women's dormitory. $1,700,000. Meem, Zehner, Holien & Assoc., Box 528, Santa Fe, archts.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

MINNESOTA—State Hy. Dpt., 1246 University Ave., St. Paul,

Woodrich Constr. Co., Hopkins, Minn. CA **$783,781.** c.conc. 14 mi. between Foley and Milaca, Benton and Mille Lacs Counties. CD 12/22, under LB.

Ferguson Constr. Co., Eunice, N. M. CA **$518,500.** 42.8 mi. crude oil pipe line from Maljamar Station to Tulk Pool, Lea Co., NEW MEXICO. Texas-New Mexico Pipe Line Co., 721 San Jacinto St., Houston, Tex.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **H. Shanedling Sons Corp.,** 2025 Nicollett Ave., Minneapolis, Minn. Owner Builds. **$1,000,000.** Northbrook SHOPPING CENTER, 22 brick stores, on site South of Hy. 100 on tract enclosed by 57 Ave. North Hy. 100 and Logan Ave. North, BROOKLYN CENTER, MINN. S. C. Smiley, 1645 Hennepin Ave., Minneapolis, Minn., archt. for Sect. 1; Thorshov & Cerny, 400 Metropolitan Bldg., Minneapolis, Minn., archt. Sect. 2. CD 9/27.

▲ **Fruin-Colnon Contg. Co.,** 1706 Olive St., St. Louis 3, Mo. CA Est. **$1,000,000.** 1 story, 240x520 ft. refrigerated WAREHOUSE to contain 1,000,000 cu. ft. refrigerated space on 27 acre tract north side Page Blvd. west of North and South Rd. in Vinita Park area, ST. LOUIS COUNTY, MO. Merchants Refrigerating Co., Lewis and O'Fallon Sts., St. Louis 6, Mo.

▲ **Thomas S. Byrne, Inc.,** Fort Worth Natl. Bank Bldg., Fort Worth, Tex., CA **$1,500,000.** department STORE, FORT WORTH, TEX. Monnigs Department Store, Otto Moning, pres., 5 and Throckmorton Sts., Fort Worth, Tex. CD 8/17.

▲ **Riedesel Constr. Co.,** 2325 Ninth Ave. N., Billings, Mont. CA Est. **$1,000,000.** 4 story OFFICE, HELENA, MONT. Western Life Insurance Co., Helena, Mont. CD 2/18.

FAR WEST

BIDS ASKED—BUILDINGS

Ore., Eugene—CLUB—BA 1/28—Young Mens Christian Assn. and Young Womens Christian Assn., Eugene, club bldg. $525,000. Hamlin & Martin, 159 W. 12 St., archts. CD 12/15.

SOON LETS CONTRACT—BUILDINGS

▲ **Calif., Muroc**—PLANT FACILITIES—Douglas Aircraft Co., 3855 Lakewood Blvd., Long Beach, soon lets contract plant facilities for Convair and Douglas at Edwards Air Force Base, $1,500,000. Austin, Field & Fry, 2311 W 3 St., Los Angeles, archts.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

† **IDAHO**—Bureau P. Rds., Dpt. Commerce, 210 Main St., Boise.

Peter Kiewit Son's Co., Idaho Falls, Idaho, CA **$700,757,** clearing, grubbing, grading, draining 9.79 mi. C standard road on Banks-Lowman Rd., Boise Co. Bids Dec. 29. CD 12/20.

† **Wheelwright Constr. Co.,** Ogden, Utah, CA **$819,611,** est. $827,605, earthwork, concrete pipe lines and structures for equalizing and wasteway reservoir and Weber Aqueduct Spec. DC4285, Weber Basin Proj., Davis and Weber Counties, UTAH. Bureau Reclamation, Dpt. Interior, Ogden, Utah. Bids Dec. 15, awarded Dec. 30. CD 12/28, under LB.

Peter Kiewit Sons Co., 345 Kieways, Arcadia, Calif., LB **$545,698,** imprv. Terminal Island Sewage Treatment Plant, LOS ANGELES, CALIF. City, City Hall, Los Angeles, Calif. Bids Jan. 5. CD 12/2.

BUILDINGS

LOW BIDS AND CONTRACTS

H. L. Brian, Jr., 1085 N. Palm St., Anaheim, Calif., CA, **$778,000.** 82 frame, stucco DWELLINGS, La Palma St., Tract 2082, ANAHEIM, CALIF. D. & C. Homes, 1085 N. Palm St., Anaheim, Calif.

IF IT'S A

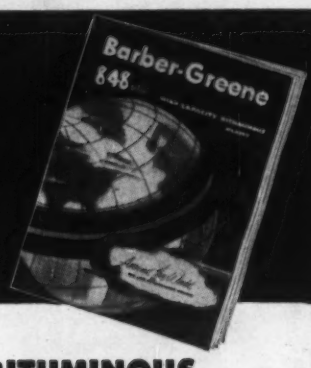
WET JOB

PLAY SAFE! ASK FOR A DEWATERING ANALYSIS BY

GRIFFIN

WELLPOINT CORP.

881 East 141st Street, New York 54, N. Y.
Hammond, Ind. Houston, Tex. Jacksonville, Fla.



BITUMINOUS "BOOK OF THE YEAR!"

Brand new Barber-Greene "848 Series" Catalog! Explains, illustrates basic B-G high-capacity plant combinations. Tells about all components. Covers high-type, intermediate, stabilization and road mixes. Definitely belongs in your bituminous "library." Get your copy. Write today.

BG **BITUMINOUS PLANTS**

see your B-G distributor or write

Barber-Greene
AURORA, ILLINOIS, U. S. A.

Lakewood Estates Development Co., 11687 San Vicente Blvd., Los Angeles, Calif., Owner Builds, $822,200 89 frame, stucco DWELLINGS, Charlwood and Edgefield Sts., BELLFLOWER, CALIF.

▲ **Larwin Co.,** 242 S. Beverly Dr., Beverly Hills, Calif., CA, $1,647,000. 183 DWELLINGS, Fenimora, Edenfield, Bygrove, Davanah, Citrus Sts., COVINA, CALIF. Hathaway Homes, Ballenture Homes, 242 S. Beverly Dr., Beverly Hills, Calif.

F. E. Young Constr. Co., 2141 Main St., San Diego, Calif., CA, $641,900, 35,354 sq. ft. inter-community HOSPITAL addn., COVINA, CALIF. Inter-Community Hospital, 275 W. College St., Covina, Calif. Bids Dec. 8, awarded Jan. 3. CD 12/16, under LB.

Home Investment Co., Box 6507, Long Beach, Calif., Owner Builds, $645,600, 60 frame, stucco DWELLINGS, Condar Ave., Los Arcos St. and Faust Ave., GLENDORA, CALIF.

▲ **Irby Building Co.,** 150 S. Flower St., Glendora, Calif., Owner Builds, $1,229,500. 124 Frame, stucco DWELLINGS, Worthy and Burnsby Drs., GLENDORA, CALIF.

▲ **Wm. Simpson Constr. Co.,** 2401 Beverly Blvd., Los Angeles, Calif., CA, $3,000,000, 12 story OFFICE, 6 and Flower Sts., LOS ANGELES, CALIF. Superior Oil Co., 601 W. 5 St., Los Angeles, Calif. Claud Bielman & Assocs., 7421 Beverly Blvd., Los Angeles, archts. Awarded Jan. 3.

J. H. Collins & Assoc., 548 S. San Vicente St., Los Angeles, Calif., CA, $669,500. 91 frame, stucco DWELLINGS, California Ave. and Foxworth St., PUENTE, CALIF. Max Builders, 548 S. San Vicente St., Los Angeles, Calif.

▲ **West Covina Properties,** 1401 W. Valinda St., Puente, Calif., Owner Builds, $1,457,700, 146 frame, stucco DWELLINGS, Dubison and Dalark Sts., PUENTE, CALIF. Ayers & Fiegl, 4253 Coldwater Canyon, North Hollywood, Calif., archts.

Herbert Goldsworthy, Box 710, Santa Monica, Calif., LB, $517,000, 30,000 sq. ft. SCIENCE and HOMEMAKING BLDG., SANTA MONICA, CALIF. Santa Monica Bd. Educ., 1333 6 St., Santa Monica, Calif. Bids Jan. 5. CD 12/22.

▲ **Stiglbauer Brothers,** 8148 E. Phlox St., Downey, Calif., CA, $1,123,975, Little Lake HIGH SCHOOL, WHITTIER, CALIF. Whittier Union High School District, 610 W. Philadelphia St., Whittier, Calif. Bids Dec. 20, awarded Jan. 4. CD 12/2.

Beckner Constr. Co., 2650 River Ave., San Gabriel, Calif., CA, $587,500, 36,000 sq. ft. Intermediate SCHOOL No. 2, WHITTIER, CALIF. Whittier School Dist., 215 W. Hadley St., Whittier, Calif. Bids Dec. 15, awarded Jan. 4. CD 12/29, under LB.

CANADA

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

SASKATCHEWAN—Dpt. Hys. & Transportation, Regina, Traves & Ducas Constr. Co. Ltd., Radville, Sask., CA, $650,284, roadwork between Weyburn and Ibsen Sask. Hy. No. 39, Regina. CD 10/1/43.

BUILDINGS

LOW BIDS AND CONTRACTS

Hodgson, King & Marble, 1401 Main St., Vancouver, B. C., CA, $789,989, BANK, Kingsway and McKay Aves., BURNABY, B. C. Royal Bank of Canada, 360 St. James St. W., Montreal, Que. E. P. Warren, c/o owner, archt.

▲ **Patrick Harrison & Co. Ltd.,** 14 St., Noranda, Que., CA, $2,000,000, sinking 1,300 ft. shaft in new MINING DEVELOPMENT in Mystery Lake area of northern Manitoba, Lynn Lake, MANITOBA, International Nickel Co. of Canada Ltd., 25 King St. W., Toronto, Ont. Awarded Jan. 4.

▲ **Foundation Co. of Canada Ltd.,** 166 Douglas St. W., Sudbury, Ont., CA, $3,750,000. first seven buildings for new Ontario Mental HOSPITAL, Cooks Mills near NORTH BAY, ONT. Dpt. P. Wks., Parliament Bldgs., Toronto, Ont. Bids Oct. 14, awarded Jan. 7. CD 9/15.

▲ **Rod and Jacques Larose Ltee,** 7409 Boyer St., Montreal, Que. Owner Builds. $1,100,000 HOUSING DEVELOPMENT, incl. 100 houses, Garieby St., MONTREAL NORTH, QUE. R. Chalifoux, 6275 Papineau Ave., Montreal, Que., archt.

Proposed Projects

WATER SUPPLY

▲ **Ill., East Moline**—City, City Hall, water filtration plant, addns. to distr. sys., $1,350,000. Consoer, Townsend & Assocs., 351 E. Ohio St., Chicago, Zone 11, consult. engrs. CD 2/19/52.

▲ **Ia., Dubuque**—City, City Hall, water softening plant. $1,500,000. Consoer, Townsend & Assocs., 351 E. Ohio St., Chicago 11, Ill., consult. engrs. CD 11/8.

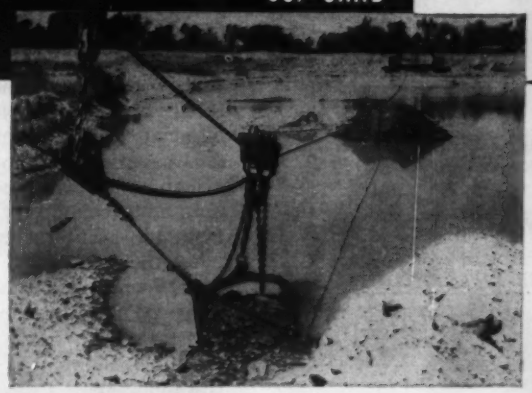
▲ **Mich., St. Joseph**—City, Lake Michigan intake and water filtration plant addns. $1,500,000. Consoer, Townsend & Assoc., consult. engrs., 351 E. Ohio St., Chicago, Ill. made the report.

▲ **Minn., St. Cloud**—City, water softening plant. $1,600,000., Consoer, Townsend & Assoc., 351 E. Ohio St., Chicago 11, Ill., consult. engrs. CD 6/16.

▲ **Tex., Beaumont**—City, Elmo Beard, mayor, water sys. rehabilitation, $15,000; water mains, running from filtration plant out into new areas of the city now without mains, $850,000; distr. lines throughout the city, $1,000,000. CD 6/6/47.

the pit: *tough...* 70% ROCK 30% SAND

the machine: Sauerman 2½-cu. yd. slackline cableway excavator



the result:

"*..a full bucket every trip*"

Another actual field report—Helena Sand & Gravel Co., of Helena, Montana, switched to this Sauerman equipment in 1946. It's been in operation since then . . . successfully performing difficult underwater excavation of rock and colloidal sand where other equipment had failed.

Sauerman Slackline Cableways span water, bogs or pits . . . reach far, dig deep, lift and carry loads to hoppers or cone piles. However tough the pit, Sauerman equipment brings in a good load every trip.

With a Sauerman Slackline Cableway, one man—in safe position—operates a single machine . . . does the complete job, quickly, efficiently, economically! Sauerman Slackline Cableways range from ⅓ to 3½ cu. yds. —span distances up to 1,000 feet . . . handle such materials as sand, gravel, clay, peat, ore and rock.

Write today for more information, including these handy field reports and catalog:

FR-216 Easy Excavating in a Tough Pit
FR-213 Cleaning Ponds Without Draining
FR-102 Digging Gravel From a River
Catalog C Sauerman Slackline Cableways

SAUERMAN BROS. INC.

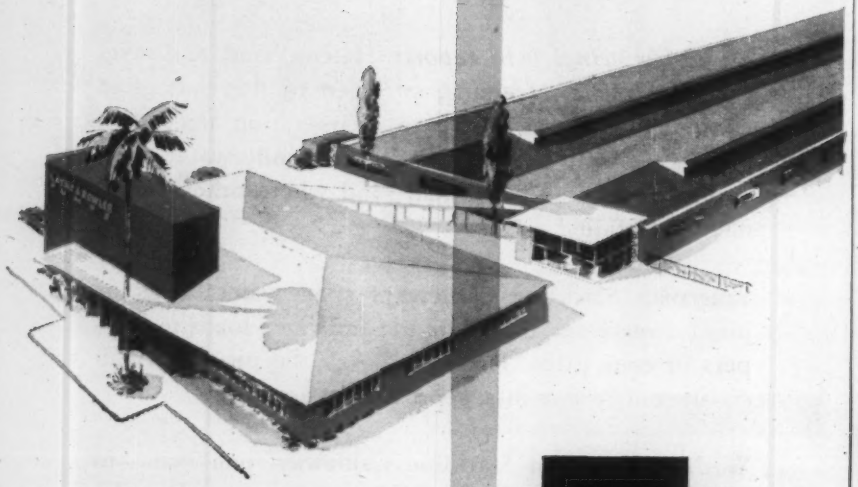
632 S. 28th Ave., BELLWOOD, ILL.

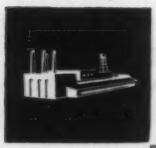
Verti-Line PUMPS

are made in this new, ultra-modern factory

At Layne & Bowler Pump Company, Verti-Line Turbine Pumps are made to the highest possible standards of quality control . . . In the foundry, iron and bronze castings are poured of metals that are test-proven to be superior . . . In the machine shop every operation must meet the industry's highest inspection standards . . . In the engineering department, every order is reviewed to insure proper selection of a pump that will meet the conditions of the application.

More than 100,000 satisfied vertical pump users agree there's no pump like Verti-Line for low first cost, economical operation, and negligible maintenance.





in the factory

on the farm

for the city

Whatever your vertical pump needs, investigate Verti-Line pumps before you buy.

Send for your free copy of our new booklet, "Pumps For Sale." Ask for Bulletin E-15

Verti-Line Pumps are the exclusive products of

LAYNE & BOWLER PUMP COMPANY

general offices and main plant

2943 VAIL AVENUE • LOS ANGELES 22, CALIFORNIA

▲ **Tex., Corpus Christi**—City, City Hall, 48 in. water main Clarkwood to Savage Lane. $1,088,000. R. L. Otto, city engr. CD 11/5/43.

SEWERS, WASTE DISPOSAL

▲ **Ia., Dubuque**—City, City Hall, sewage treatment plant, intercepting sewers. $1,800,000. Consoer, Townsend & Assocs., 351 E. Ohio St., Chicago 11, Ill., consult. engrs. CD 7/20/45.

▲ **La., Lake Charles**—First Dist. Sewerage Bd., sewerage constr. $2,000,000. Elmer E. Shutts, 324 Pujo St., consult. engr. CD 3/16/50.

▲ **Wis., Green Bay**—City, 3 year program for storm sewers, $1,316,000; $424,000 expended in 1955. CD 9/8/53.

▲ **Ont., Toronto**—Municipality of Metropolitan Toronto, 67 Adelaide St. East, sewage disposal plant on Humber Valley Golf Course $14,000,000. trunk sewer $1,250,000. sanitary trunk sewer in Humber Valley 8,000 ft. $500,000. CD 2/8.

▲ **Sask., Regina**—City, City Hall, new trunk sewers in various sections of city $7,074,400. Alvord, Burdick & Howson, 20 N. Wacker Dr., Chicago, Ill., U.S.A. consult. engrs. CD 11/19.

STREETS AND ROADS

▲ **UTAH**—State Road Comn., Salt Lake City,
Box Elder Co.—6 mi. between Blue Creek Junc. and Promontory FAS. $180,000.
4.7 mi. from Connor's to Penrose FAS $25,000.
Cache Co.—imprv. 5 mi. between Trenton and Clarkston FAS, $160,000.
Iron Co.—15.7 mi. U.S. 91, FA. Buckhorn Flat, $800,000.
Salt Lake Co.—3.5 mi. four-lane hy. widened and straightened, FA. U.S. 40, $1,418,000.
U. S. 91 Salt Lake to Davis Co. 3.5 mi., $800,000.
Summit Co.—7.9 mi. U.S. 303 from Emory to Wastch FA, $335,000.
Uintah Co.—U. S. 40 between Vernal-Jensen FA, $780,000.
Utah Co.—3.5 mi. Utah 52 from Orem to mouth of Provo Canyon, $100,000.
U. S. 189 from Provo to mouth of Provo Canyon $160,000.
Weber Co.—Henefer to Echo Junction, $500,000. CD 5/10/44.

EARTHWORK, WATERWAYS

▲ **Calif., Gilroy**—South Santa Clara Valley Water Conservation Dist., Gilroy, $2,111,000, bond election Feb. 1, Uvas Dam. CD 5/8/53.

AIRPORTS

▲† **Md., Andrews Air Force Base**—UTILITIES—U. S. Eng., First and Douglas Sts. N. W., Wash. 25, D. C., utilities, hospital area, $500,000-$1,000,000; masonry headquarters bldg. Div. A.D.C., $350,000-$500,000. CD 10/1/51.

▲ **Mich., Detroit**—AIRPORT—Bd. Supervs., Wayne Co., 3800 Cadillac Tower, terminal bldg. $5,500,000; aprons, taxiways and runways, $3,200,000; custom bldg., underground fuel storage, lighting, $1,300,000. Leroy C. Smith, city engr. CD 7/29/51.

▲† **N. D., Grand Forks**—JET FIGHTER BASE—U. S. Eng., 1709 Jackson St., Omaha, Neb., jet fighter base. $7,050,000.

PUBLIC BUILDINGS

▲ **Calif., Glendale**—MEMORIAL CENTER—City, City Hall, $3,250,000 bond election Apr. 12, memorial center. CD 3/18/46, under Unclassified.

▲ **Calif., Los Angeles**—SCHOOLS—Bd. Educ., 1425 S. San Pedro St., $133,000,000 bond election Apr. 5, new schools. CD 6/13/52.

▲ **Calif., Nevada City**—SCHOOLS—Nevada Union High School District, Buena Vista St., Grass Valley $1,600,000 bond election May 15, new schools Nevada City and Grass Valley. CD 10/7/52.

▲ **Calif., Redwood City**—SCHOOLS—Sequoia Union School Dist., Broadway and El Camino Real, $6,250,000 bond election Mar. 1, two new high schools and addns. CD 12/15.

▲ **Calif., Tulare**—SCHOOL—Tulare School Dist., 600 N. Cherry Ave., $1,250,000 bond election Feb. 4, new school.

▲ **Conn., East Hartford**—SCHOOLS—Town, Francis L. Paquette, chn. School Bldg. Comn., Town Hall, High School South End, $1,000,000; school between Oak and Forbes Sts., $350,000.

▲ **Mich., Port Huron**—SCHOOL—City, J. F. Gibbs, mgr., plans by Wyeth & Harmon, Inc., 1602 Military St., and Louis C. Kingscott & Assoc., 511 Monroe St., Kalamazoo, high school, $1,800,000. CD 11/25/52.

▲ **Mo., Clayton (St. Louis 5, P. O.)**—HOSPITAL—St. Louis County, c/o Luman P. Matthews, co. superv., Court House, plans by Leo A. Daly Co., 411 N. 7 St., Ambassador Bldg., St. Louis, Zone 1, 150-bed hospital to care for chronically ill. First unit of 100-bed capacity, 3-story, est. $1,859,268, with 50-bed addn. to follow. Total $2,225,000. CD 10/16/44.

▲ **Mont., Boulder**—ASSEMBLY HALL, etc.—State, Bd. Examiners, Helena, plans by J. G. Link & Co., 111 N. Montana St., Butter, assembly hall, classroom unit,

boys' and girls' dormitory at State Training School for retarded children, $1,500,000. CD 11/10.

▲ **N. J., East Paterson**—SCHOOL—Bd. Educa. 16 Ave., plans by Alfonso Alvarez, 243 Lorain Ave. Upper Montclair, Junior-Senior High School. $2,000,000.

▲ **N. Y., Bedford—Mt. Kisco**—HIGH SCHOOL—Central School Dist. 2, Mt. Kisco, plans by Moore & Hutchins, 215 E. 37 St., New York, Zone 16, Junior-Senior High School, 155-acre tract, on Rte. 172. $3,000,000.

▲ **Pa., Media**—HIGH SCHOOL—Central Delaware County Joint School Dist., Media, plans by The Ballinger Co., 121 N. Broad St., Phila., high school at Lima. $2,000,000.

▲ **Pa., Sanatago**—HIGH SCHOOL—Joint School Bd., Lower, Upper and West Pottsgrove Twps., Sanatago, plans by Buchart Eng. Corp. of Lancaster, archts.-engrs., 920 Columbia Ave., Lancaster, Junior-Senior High School. $1,800,000.

▲ **Wis., Waukesha**—COURT HOUSE—Waukesha Co., plans by Foss-Jansma, Inc., 111109 W. Blue Mound Rd., Milwaukee, court house. $1,700,000.

▲ **Ont., Sudbury**—SCHOOL—Nickel District High School Bd., Sudbury, plans by Alward & Gouinlock, 57 Bloor St. W., Toronto, high school $1,340,000.

COMMERCIAL BUILDINGS

▲ **Calif., La Habra**—DWELLINGS—Howard L. Torry, 4400 Old Spanish Trail, Houston, Tex., plans by L. C. Major & Assocs., 11015 S. Paramount Blvd., Paramount 150 frame, stucco dwellings. $1,500,000.

▲ **Calif., Sacramento** — DEPARTMENT STORE — Sears, Roebuck & Co., 12 and K Sts., store, on Swanston Estates Property, $2,500,000.

▲ **Calif., San Mateo**—OFFICE—Economy Builders, Inc., 500 S. El Camino Real, San Mateo, 6 story office, $12,000,000.

▲ **Conn., West Hartford**—SHOPPING CENTER—Corbin Realty Corp., Neil H. Ellis, secy. Crosby Rd., Manchester, plans by A. H. Salkowitz, 37-60 82 St., Jackson Heights, N. Y., shopping center, incl. 40 stores, 3,000 car parking area, 37-acre tract Corbin's Corner, south side of New Britain Ave. $5,000,000.

▲ **Md., Glen Burnie**—DEPARTMENT STORE—Hochschild Kohn & Co., Lexington and Howard Sts., Baltimore, Zone 1, plans by Rogers & Taliaferro, 18 West St., Annapolis, Md., 150,000 sq. ft. department store in connection with new 50-store shopping center, Harundale, near here.

▲ **Mass., Sharon**—RESIDENTIAL DEVELOPMENT—Martin Cerel, 18 E. Central St., Natick, residential development, 150 units, adjacent to Lake Massapoag, $2,000,000.

▲ **Mich., Mt. Clemens**—SHOPPING CENTER—Harvey Bielfield, 833 Penobscot Bldg., Detroit, plans by Theodore Rogvoy, 929 Fox Bldg., Detroit, 25-stores, Ingleside Shopping Center, $1,500,000.

▲ **Minn., Duluth**—BANK—First and National Bank, W. D. Wiard, pres., Third Ave. W. and Superior St., plans by T. J. Shefchik, 307 Lonsdale Bldg., Duluth, 8 story bank, $2,500,000.

▲ **N. J., Newark**—OFFICE—Mutual Benefit Life Insurance Co., 300 Broadway, plans by Eggers & Higgins, 100 E. 42 St., New York 17, N. Y. home office, Broad St. opposite Washington Park, $8,000,000.

▲ **N. Y., Flushing** — APARTMENT — Kissena Manor Corp., c/o Julius Fishkind, archt., 161-19 Jamaica Ave., Jamaica, 6 story apartment, Kissena Blvd., west of Franklin Ave. $1,500,000.

▲ **N. Y., New York** — CATHEDRAL, etc. — Armenian Church in America, 630 Second Ave., Zone 16, plans by Eggers & Higgins, 100 E. 42 St., Zone 17, cathedral and cultural center, Second Ave. between 34 and 35 Sts. $1,000,000. CD 9/15/49.

▲ **N. Y., New York**—CHURCH, etc.—Church of St. Benedict, 2956 Bruckner Blvd., Zone 61, plans by Paul C. Reilly, 111 Fifth Ave., Zone 3, 2 story church and 3 story convent, in block bounded by Bruckner Blvd., Edison, Logan and Otis Aves. $1,000,000.

▲ **N. Y., New York**—APARTMENT—50 Sutton Place Corp., 120-44 Queens Blvd., Kew Gardens, plans by Lawrence M. Rothman, 147 E. 125 St., New York, Zone 35, 19 story apartment, 50 Sutton Place South. $4,000,000.

▲ **N. Y., New York** — HOSPITAL WING — Lenox Hill Hospital, 76 St. and Park Ave., plans by York & Sawyer, 101 Park Ave., Zone 17, 12-story wing and other facilities. $3,500,000. CD 12/15.

▲ **N. Y., New York**—OFFICE—Syndicate, c/o Abraham Marinoff, 793 Madison Ave., plans by Ervin Palmer, 624 Madison Ave., 16 story office, 515 Park Ave., southeast corner 60 St. $1,500,000.

▲ **Okla., Tulsa**—APARTMENT HOTEL—Columbia Apartments, Inc., Kennedy Bldg., plans by Steele, Sandham & Steele, 412 Electric Bldg., Omaha, Neb., 15 story apartment hotel, 21 and Columbia Sts. $2,000,000.

▲ **Tex., Houston**—APARTMENT—Syndicate, c/o Joe L. Albritton, Trustee, Sterling Bldg., 21 story, 312 unit apartment, 2½ acre tract near Hermann Park at Almeda Rd. $3,000,000.

▲ **Tex., Irving**—SHOPPING CENTER—Mayflower Investment Co., Irving, and c/o Carr P. Collins & Assocs., 912 Commerce St., Dallas, plans by Wyatt C. Hedrick, archt.-engr., 904 Fort Worth Ave., Dallas, shopping centers, Units 1, 2 and 3. $1,050,000.

▲ **Tex., Pasadena**—DWELLINGS—R. G. Whitman, 2305 Merle St., Houston, 25 cedar shake, brick trim dwellings; 33 frame, masonry trim dwellings; 29 cedar shake and brick trim dwellings in last sect. of Shaver Pl. $1,065,000.

▲ **Tex., San Antonio**—DWELLINGS—Ray Ellison Homes, Inc., Westridge Park, 28 frame dwellings; 35 frame, brick trim dwellings; 38 frame dwellings, in Westridge Park Subdivision for Negroes. $1,036,100.

▲ **Wis., Waukesha**—HOUSING—Lowe & Old Constr. Co., 149 W. Broadway, 63 houses, $1,050,000; 22 houses, $220,000.

▲ **Ont., Toronto**—APARTMENT—Owner, c/o W. Shulman, archt., 1173 Bay St., two 10 story, bsmnt., 53x99 ft., penthouse, 62-suite, steel frame, concrete, brick apartment bldgs., 561 Avenue Rd. $1,200,000.

INDUSTRIAL BUILDINGS

▲ **Calif., San Francisco**—PLANT, etc.—S & W Fine Foods, Inc., 155 Berry St., plans by Albert F. Roller, 1 Montgomery St., coffee plant, office, warehouse. $1,750,000. CD 7/23.

▲ **Ia., Davenport**—MILL—Aluminum Co. of America, Gulf Bldg., Pittsburgh, Pa., rolling mill addn. $5,000,000. CD 10/10/52.

▲ **Mo., Sedalia**—WAREHOUSE—Pittsburgh Corning Corp., 420 Fort Duquesne Blvd., Pittsburgh, Pa., branch warehouse, $1,500,000.

▲ **O., Dayton**—ENGINEERING and RESEARCH—National Cash Register Co., S. Main and K Sts., 6 story, engineering and research bldg. with 210,000 sq. ft. office and laboratory space, west side of S. Main St. $4,000,000.

▲ **O., Kettering**—FACTORY—Specialty Papers Co., 802 Miami Chapel Rd., Dayton, 1 story, 125,000 sq. ft. factory, south of Dorothy Lane, between extended Woodman Dr. and Cemetery Rd. $1,250,000.

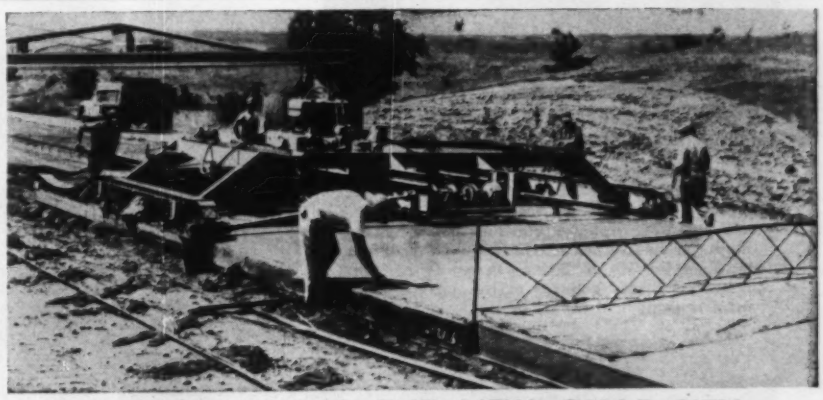
▲ **Pa., Pittsburgh**—GARAGE—Equitable Life Assurance Society of the U. S., 393 7th Ave., New York, N. Y. concrete and reinforced steel 600-car capacity parking garage, open deck ramp. $1,500,000. H. K. Ferguson Co., 1783 E. 11 St., Cleveland, O., engr.

▲ **Tex., Houston**—PARKING GARAGE—Tennessee Gas Transmission Corp., Commerce Bldg., plans by C. Herbert Cowell & Hugo Neuhaus, Jr., 2302 LaBranch St., 4 to 5 story, 400,000 sq. ft. parking garage. $2,240,000. H. E. Bovay, Jr., M. Esperson Bldg., consult. engr. and Thomas E. Willier, Commerce Bldg., traffic consult. CD 8/31.

▲ **Ont., Toronto**—FACTORY, etc.—Crouse-Hinds Co. of Canada Ltd., 7 Labatt Ave., Toronto, 50,000 sq. ft. warehouse and factory near Birchmount Ave. on 18-acre site, $6,000,000. Giffels & Vallet of Canada Ltd., Canada Trust Bldg., Windsor, consult. engrs. CD 12/29.

UNCLASSIFIED

▲ **Ont., St. Thomas**—AUTOMATIC TRAIN CONTROL SYSTEM—New York Central System, C. F. Grimes, engr., R.R. 4, St. Thomas, automatic train control sys. from St. Thomas (Windsor to Fort Erie and Suspension Bridge, Niagara Falls). $1,500,000-$2,000,000.

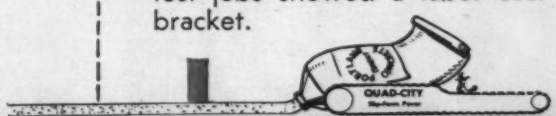


ANNOUNCING THE NEW QUAD-CITY

SLIP FORM CONCRETE PAVER

(NO PAVING FORMS REQUIRED)

The "Quad City" Paver in its first test run reached a record run in a 9½ hr. day of 1550' of 9" pavement 24' in width. This record days run was accomplished by the use of one Dual drum paver. These first test runs were made in constructing base course pavement. The revised and newly produced machine will finish pavement to modern highway specifications and is capable of handling concrete from two dual drum pavers on similar jobs as mentioned above. Subgrading, paving and curing on test jobs showed a labor cost in the twenty cent bracket.



(PATENTS PENDING)

QUAD-CITY EQUIPMENT CO.

ROCK ISLAND, ILLINOIS

FOR MORE MILES OF PRECISION PAVING PER DOLLAR

PLEASE MAIL FREE LITERATURE TODAY.

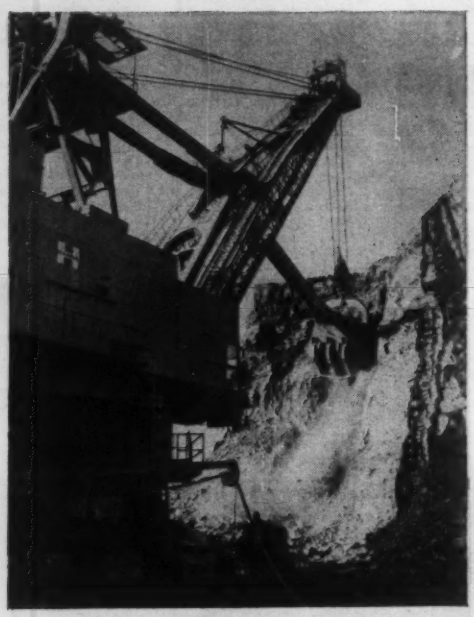
NAME _____

ADDRESS _____

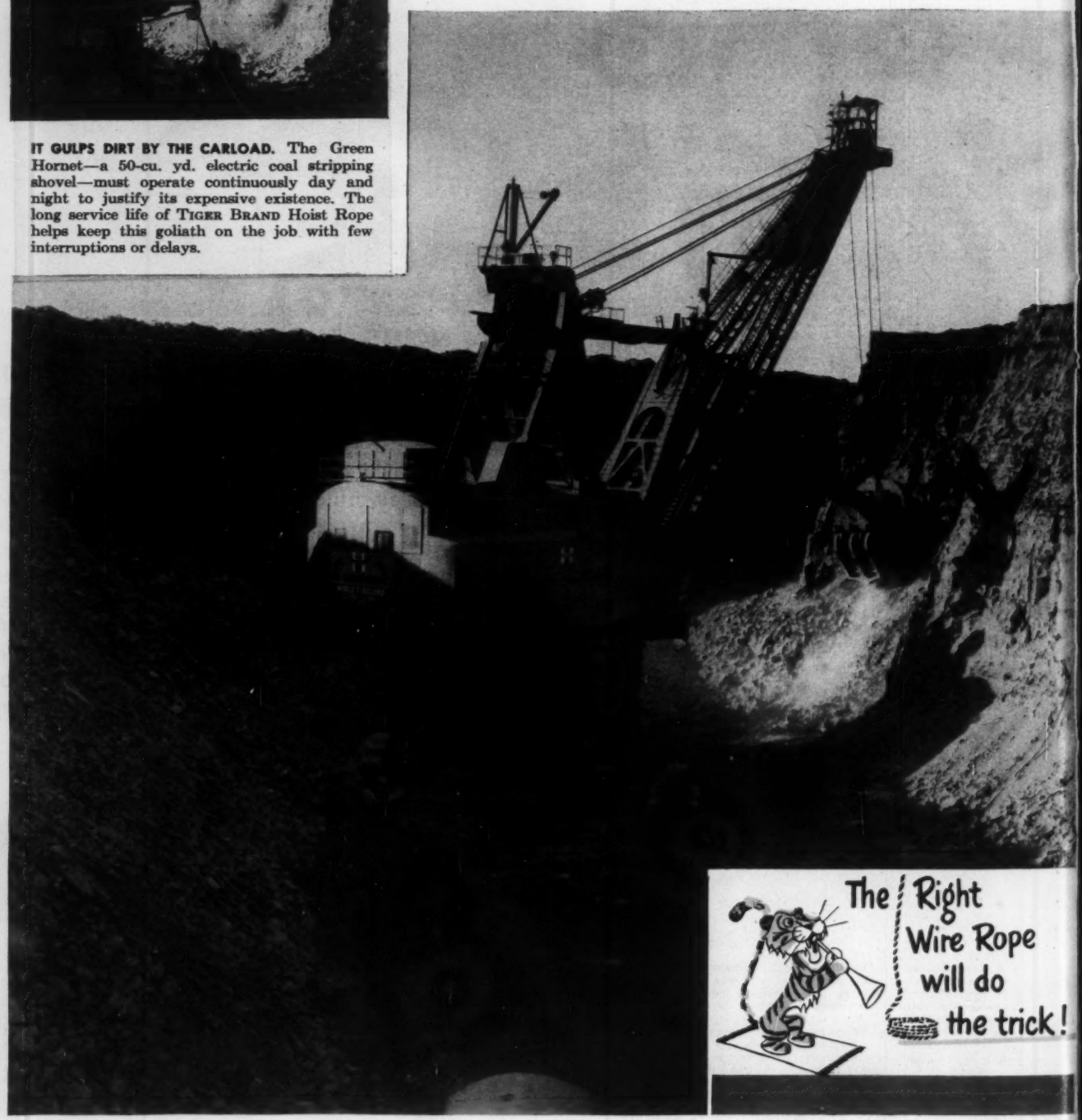
CITY _____ STATE _____

Over a million

with ONE

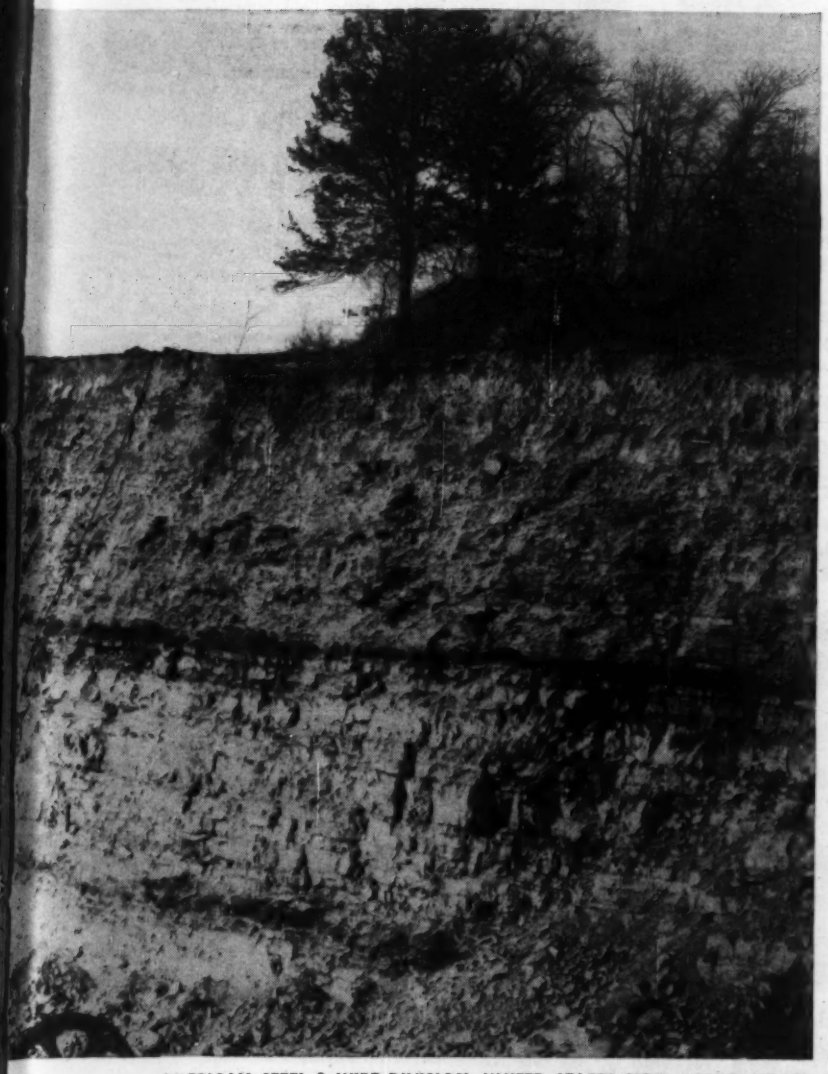


IT GULPS DIRT BY THE CARLOAD. The Green Hornet—a 50-cu. yd. electric coal stripping shovel—must operate continuously day and night to justify its expensive existence. The long service life of TIGER BRAND Hoist Rope helps keep this goliath on the job with few interruptions or delays.



yards of tough digging

Tiger Brand Hoist Rope



THE first TIGER BRAND Hoist Rope installed on this coal stripping shovel worked 65 shifts in 23 days before it was replaced. It moved 1,161,155 cu. yds. of overburden in those three weeks.

That's good service in a punishing coal stripping operation. This big 50-cu. yd. shovel is busy every hour of the day and night, stripping overburden for Hanna Coal Company at Georgetown, Ohio. It averages as high as 54,000 yards a day. Its hoist rope really has to be *rugged* to work at that clip. The first TIGER BRAND Rope worked so well that an identical TIGER BRAND Hoist Rope replaced it.

This is not a unique case. We know of many TIGER BRAND Ropes on heavy-duty earth moving equipment that have moved a million or more yards before replacement. In cases of easier digging, service in excess of 2,000,000 cubic yards is not unusual. On *any* job, the correct TIGER BRAND Rope gives you the longest possible service . . . steady, rope-after-rope performance that *keeps down costs.*

Send the coupon for more information.

FREE ROPE BOOKLET

American Steel & Wire
Dept. A-15, Rockefeller Building
Cleveland 13, Ohio

Please send me, without obligation, a copy of your helpful wire rope selection guide, "The Right Rope for the Job."

Name.....

Company.....

Address.....

City & State.....

AMERICAN STEEL & WIRE DIVISION, UNITED STATES STEEL CORPORATION, GENERAL OFFICES: CLEVELAND, OHIO

COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO • TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA., SOUTHERN DISTRIBUTORS

UNITED STATES STEEL EXPORT COMPANY, NEW YORK

USS AMERICAN TIGER BRAND WIRE ROPE

USS

Excellay Preformed

UNITED STATES STEEL

Bids—Low Bids—Contracts—Second Section

NEW ENGLAND

BIDS ASKED—HEAVY CONSTRUCTION
STATE HIGHWAY LETTINGS
BRIDGES
January 27, February 3 Massachusetts

▲ **MASSACHUSETTS**—BA 2/8—Massachusetts Turnpike Auth., 80 Boylston St., Boston,
Palmer—Contr. 51-052 hy. and bridge constr. $2,500,000. Plans deposit $60. Howard, Needles, Tammen & Bergendoff, 80 Boylston St., Boston, engrs. CD 8/11.

MIDDLE ATLANTIC

BIDS ASKED—HEAVY CONSTRUCTION
STATE HIGHWAY LETTINGS
BRIDGES
February 3 New Jersey & Pennsylvania
STREETS AND ROADS
January 25 Maryland

SOON LETS CONTRACT—BUILDINGS

▲ **Pa., Pittsburgh**—HOSPITAL, etc.—soon lets contract—West Penn Hospital, 4800 Friendship Ave., 2 story, bsmnt. brick, block hospital addn., alterations, $3,000,000. Alfred Reid Assoc., 1401 Keystone Bldg., archts. CD 9/10/53.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **Fischback & Moore, Inc.**, 226 E. 41 St., New York, 17, N. Y., CA **$2,352,806**, furnishing, installing cable equip. for Rockaway Line, IND Div., NEW YORK. New York City Transit Auth., 370 Jay St., Brooklyn 1, N. Y. Bids Dec. 3. CD 12/17, under LB.

▲ **Mount Vernon Bridge Co.**, Sugar and Adams Sts., Mt. Vernon, O., CA **$3,176,577**, fabrication and erection superstructure for Barnhart Island Bridge over St. Lawrence River, near Massena, St. Lawrence Co., Spec. 5422-C, St. Lawrence Contr. No. 6, NEW YORK. The Power Authority of the State of New York, 270 Broadway, New York 7, N. Y. Bids Dec. 7. CD 12/9 under LB.

▲† **U. S. Eng., 80 Lafayette St., New York 13, N. Y.** indefinitely postponed bids to have been opened Feb. 10, AM dormitory and BOQ, FY 55, Stewart Air Force Base, NEWBURGH, N. Y. **$1,000,000-$3,000,000.** James C. MacKenzie, 5 E. 57 St., New York 22, N. Y., archt. CD 11/12.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Deer Park Homes, Inc.**, c/o Alwin Cassens, Jr., archt., 145 S. Franklin Ave., Valley Stream, N. Y. Owner Builds. **$7,000,000.** 500 HOUSES, tract adjoining Belmont Lake State Park on Deer Park Ave., BABYLON, N. Y.

▲ **Caristo Constr. Co.**, 26 Court St., Brooklyn 2, N. Y. CA **$3,253,000**, general constr.;
Bank Electrical Co., 126 W. 32 St., New York 1, N. Y. CA **$730,000**, electrical work for Wm. E. Grady Vocational HIGH SCHOOL, Brighton 6th St. between Shore Parkway and Brighton 4th Rd., BROOKLYN, N. Y. Bd. Educ., Bureau Constr., 42-15 Crescent St., Long Island City 1, N. Y. Bids Dec. 10. CD 12/15, under LB.

▲ **Rosewood Gardens Homes**, c/o Trylon Realty Co., 98-89 Queens Blvd., Forest Hills, N. Y. Owner Builds. **$2,000,000.** 150 HOUSES, tract off Northern State Parkway near Exit 35, HICKSVILLE, N. Y.

▲ **C. W. C. Constr. Corp.**, 105 Court St., Brooklyn 2, N. Y. CA **$1,823,500**, general constr.;
Heckler Electric Co., 44 Schenectady Ave., Brooklyn 13, N. Y., CA **$597,700**, electrical work for new addn. to and modernization existing bldg. of Williamsburg Vocational HIGH SCHOOL, Bushwick Ave., Siegel and McKibbens Sts., BROOKLYN, N. Y. Bd. Educ., Bureau Constr., 42-15 Crescent St., Long Island City 1, N. Y. Bids Dec. 9. CD 12/13, under LB.

▲ **John Rosenblum, Inc.**, 1860 Broadway, New York 23, N. Y. CA **$1,934,000**, general constr. JUNIOR HIGH SCHOOL 166, Van Sicklen Ave. and Linden Blvd., BROOKLYN, N. Y. Bd. Educ., Bureau Constr., 42-15 Crescent St., Long Island City 1, N. Y. Bids Oct. 29. CD 11/3, under LB.

SOUTH

BIDS ASKED—HEAVY CONSTRUCTION
STATE HIGHWAY LETTINGS
BRIDGES
February 4 Tennessee
STREETS AND ROADS
January 26 Louisiana — February 4 Tennessee

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲† **Thompson & Street**, 47 Trinity Ave. S.W., Atlanta, Ga., LB, $3,415,453, three warehouses and railroad to warehouse, Robins Air Force Base, ENG-09-133-55-28, MACON, GA. U. S. Eng., 200 E. St. Julian St., Savannah, Ga. Bids Dec. 28. CD 12/21.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **M. A. Mace**, Fairfax, Va., Owner Builds. **$7,000,000.** constr. between 400 and 500 brick detached HOMES near Lake Barcroft and Columbia Pike, FAIRFAX, VA. Harry Ormston, South Langley Lane, McLean, Va., archt.

▲ **Degive, Dunham & O'Neill**, 1478 Mescalin St. N.W., Atlanta, Ga., LB, **$2,053,000.** Continuing EDUCATION CENTER, University of Georgia Campus, ATHENS, GA. Bd. Regents, University System of Georgia, 20 Ivy St., Atlanta, Ga. Bids Jan. 7. CD 7/23.

▲ **Arnold Constr. Co.**, Murray Bl., Palm Beach, Fla., CA **$3,547,977** MEDICAL SCHOOL for University of Florida, GAINESVILLE, FLA. State Bd. Control Education Bldg., Florida State University, Tallahassee, Fla. Bids Jan. 5. CD 8/11, under CA.

▲ **R. F. Farnsworth & Co., Inc.**, 1515 S. Salcedo St., New Orleans, La. LB **$6,645,000.** 10 story, bsmnt., CIVIC CENTER and CITY HALL, NEW ORLEANS, LA. City, Bureau Purchasing, 302 City Hall, New Orleans, La. Bids Jan. 11. CD 12/2.

MIDDLE WEST

BIDS ASKED—HEAVY CONSTRUCTION
STATE HIGHWAY LETTINGS
BRIDGES
February 1 Indiana — February 1 Wisconsin
STREETS AND ROADS
January 26 Indiana — February 1 Wisconsin

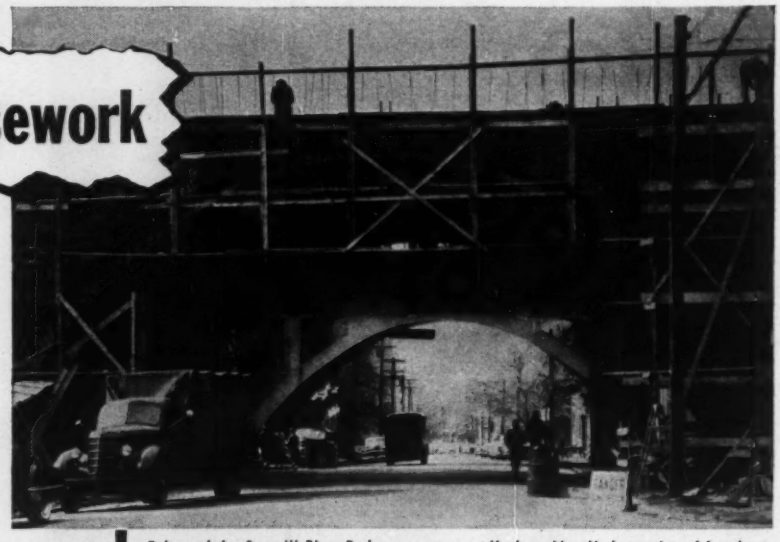
HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **W. J. Meagher & Sons, Inc.**, 1300 S. Water St., Bay City, Mich., CA **$3,407,752**, $4,500,000. Clague Rd. water intake and line, 13,000 ft. to shore;
Square & Marra Constr. Co., 4537 Mayfield Rd., South Euclid 21, O., CA **$1,219,560**, 8 ft. pipe from Clague Rd. water intake line to Clague Rd. pumping station, rein.-con. CLEVELAND, O. City, Div. Water & Heat, City Hall, Cleveland, O. Bids Jan. 7. CD 1/12 under LB.

▲ **INDIANA**—Indiana Toll Road Comn., 309 W. Washington St., Indianapolis, Zone 4,
Peter Kiewit Sons Co. & Condon-Cunningham Co., 229½ W. Washington St., Indianapolis, Ind., CA, **$3,994,031**, Contract C-13 and C-14, Indiana East-West Toll Road in Porter Co. Bids Dec. 15. CD 12/20, under LB.

Pre-Fabricated Falsework



- **Engineered for Safety**
- **Precision Made to Save Time and Reduce Costs**

Traffic proceeded without interruption while these twin overpasses were under construction, due to foresight of highway officials and pre-fabricated falsework by Timber Structures, Inc. Thoroughly engineered and precision fabricated at the factory, the falsework was assembled and erected in a fraction of the time required by site-made forming supported by a multitude of traffic-stopping posts. After first overpass was poured, forms were moved into position for the second structure, doubling the saving of time.

Final costs thus were substantially lowered and complete protection was provided against possible failure during construction.

On your next concrete forming project, whether it is a bridge or poured concrete shell structure, let us show you how our pre-fabricated falsework will increase your profit margin. For detailed information see your nearest Timber Structures representative, or write directly to us.

Falsework for Sawmill River Parkway overpass at Yonkers, New York, consists of four bents of 60-foot span and center height of 21 feet. Designed by New York Department of Public Works. General contractors: Lenri, Inc. and Wm. P. Bergan, New York City; fabrication and erection by Timber Structures, Inc.

TIMBER STRUCTURES, INC.

P. O. BOX 3782-C, PORTLAND 8, OREGON

Offices in Ramsey, N. J.; Garden City, N. Y.; Chicago; Ferndale, Mich.; Kansas City; St. Louis; Minneapolis; Boston; Columbus; Des Moines; Decatur; Wichita; Dallas; Houston; Birmingham; Charlotte; Memphis; West Hartford; Seattle; Spokane; Denver.

TIMBER STRUCTURES, INC. OF CALIFORNIA • Richmond, California

Local Representatives throughout the United States and Canada

▲ **O. W. Burke Co.**, 1032 Fisher Bldg., Detroit, Mich. CA $2,248,000. sewage treatment plant, DETROIT, MICH. Bd. Water Comrs., Alfred J. Simpson, pres., Water Bd. Bldg., 735 Randolph St., Detroit 26, Mich. Bids Jan. 5. CD 11/24.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Frank Messer & Sons, Inc.**, 4612 Paddock St., Cincinnati, O., CA $1,881,600. general constr. Mershon AUDITORIUM, at Ohio State University, COLUMBUS, O. State Dpt. P. Wks., State Dpts. Bldg., Columbus, O. Bids Dec. 21. CD 1/11, under LB.

▲ **South Gary Homes, Inc.**, 541 Washington St., Gary, Ind., Own Forces, $3,500,000. 360 HOMES, GARY, IND.

▲ **Eastgate Homes, Inc.**, 541 Washington St., Gary, Ind., Own Forces, $2,000,000, 200 HOMES, HAMMOND, IND.

▲ **G. W. Lindstrom**, 2155 Farrell Ave., Park Ridge, Ill. Own Forces. $1,800,000, 200 HOMES, Dempster and Vernon Sts., near DES PLAINES, ILL. Ekroth, Martorani & Ekroth, 343 S. Dearborn St., Chicago 4, Ill., archts.

▲ **Charles B. Johnson & Son**, 6 N. Michigan St., Chicago 2, Ill., CA $3,300,000, 325,000 sq. ft. FACTORY, LINCOLNWOOD, ILL. Ditto Inc., corner Harrison and Oakley Aves., Lincolnwood, Ill. Bids Nov. 30, awarded Jan. 5. CD 11/4.

WEST OF MISSISSIPPI

BIDS ASKED—HEAVY CONSTRUCTION

STATE HIGHWAY LETTINGS

BRIDGES
January 28 Missouri

STREETS AND ROADS
January 28 Missouri, North Dakota

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **Northern Natural Gas Co.**, 2223 Dodge St., Omaha, Neb. Owner Builds. $7,890,000, gas pipe lines covering considerable part of South Dakota extending from Sioux Falls to Aberdeen and taking Mitchell, Watertown, Madison, Brooklyn, Aberdeen and many smaller points, SOUTH DAKOTA. F. B. Rabb, c/o owner, ch engr. CD 10/9/52.

▲† **Nilson-Smith Constr. Co.**, 214 Fifth Ave. S., Great Falls, Mont., and **Northwestern Engineering Co.**, 1311 St. Joe St., Rapid City, S. D. LB $4,784,819, est. $5,081,543. 45,000 sq. yd. cement concrete runway exten., 163,000 sq. yd. cement concrete apron, 30,000 sq. yd. asphaltic concrete taxiway and structural steel alert hangar at Great Falls Air Force Base, ENG-45-108-55-85, GREAT FALLS, MONT. U. S. Eng., 4735 E. Marginal Way, Seattle 4, Wash. Bids Jan. 7. CD 12/30.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Steenburg Constr. Co.**, 1371 Marshall Ave., St. Paul, Minn. CA Approx. $2,000,000. 27-store Rose Plaza SHOPPING CENTER, Snelling Ave. and Hy. 36, ROSEVILLE (P. O. ST. PAUL), MINN. Rose Building Corp., D. Rees, pres., 718 Second Ave. S., Minneapolis, Minn. G. R. Sauers Co., 1550 W. Larpenteur Ave., St. Paul, Minn., engr.-archt. CD 10/8/52, under Allied Stores, Inc., as owner.

▲ **J. T. Commerford**, 1648 Ford Parkway, St. Paul, Minn. and **Lyle Murray**, 5720 Wayzata Blvd., Minneapolis, Minn. Owner Builds. $3,500,000. HOUSING and SHOPPING CENTER, Hudson Rd. in area bounded by East Ave., Ruth and Conway Sts., ST. PAUL, MINN. Ellerbe & Co., E. 505 First National Bank Bldg., St. Paul, Minn., archts. CD 6/16.

▲ **Skogman Constr. Co.**, 105 10 St. N. E., Cedar Rapids, Ia. Owner Builds. $5,500,000. HOUSING DEVELOPMENT, CEDAR RAPIDS, IA.

▲ **Flett Constr. Co.**, 4325 Troost Ave., Kansas City, Mo. CA 1 and 2 story STORE, OFFICE and roof parking proj. 18 and Baltimore Ave.-Main St., KANSAS CITY, MO. Oppenheimer Industries, c/o Harold L. Oppenheimer, 1615 Baltimore Ave., Kansas City, Mo. (Correction—cost, 1st unit $150,000, total $1,500,000). CD 12/23, under CA.

FAR WEST

BIDS ASKED—HEAVY CONSTRUCTION

STATE HIGHWAY LETTINGS

BRIDGES
February 19 Oregon

STREETS AND ROADS
February 19 Oregon

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **H. K. Ferguson Co.**, 411 W. 5 St., Los Angeles, Calif., CA, $2,500,000. RESEARCH LABORATORY, LIBRARY and SHOPS, etc., ANAHEIM, CALIF. Richfield Oil Co., 555 S. Flower St., Los Angeles, Calif. Bids Nov. 12, awarded Jan. 10. CD 10/22.

(Proposal Advertisements see pp. 82 to 84)

"They tilted 30,000 tons of concrete..."

This unique ore-loading wharf designed in Plastiment-concrete by Frederic R. Harris, Inc., Consulting Engineers of New York, for the Aluminum Company of Canada's gigantic Kitimat project, was cast on its side, floated into place and tilted 90° into final position.

Floating Plastiment-concrete structures are not new. . . . Of the seven American projects featured as Famous Floating Concrete Structures in the May issue of the Journal of the American Concrete Institute, five were constructed of Plastiment-concrete . . . most of the foreign jobs shown also contained Plastiment, supplied from the fourteen overseas Sika manufacturing organizations.

While you may not be designing a floating concrete pier, the special qualities that made this concrete denser, more uniform, and more resistant to cracking and abrasion are undoubtedly a must in your own construction projects. Performance has proven that Plastiment can help you attain this goal.

For the story on the Kitimat project, plus a detailed explanation of Plastiment's exclusive action on cement gels, write for your copy of Sika Job 14 and the illustrated brochure "PLASTIMENT CONCRETE DENSIFIER." Our Engineering Department will be glad to tell you how Plastiment can help you on your present job.

Sika

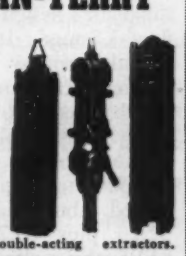
PLASTIMENT CONCRETE DENSIFIER

SIKA Chemical Corporation, Passaic, New Jersey

Branch Offices: Pittsburgh, Salt Lake City, Montreal, Chicago, Panama • Dealers in Principal Cities

McKIERNAN-TERRY

Wide Range of **PILE HAMMERS and EXTRACTORS**



Complete standardized line of 11 double-acting hammers, 5 single-acting hammers and 2 double-acting extractors.

McKIERNAN-TERRY CORPORATION
13 Park Row New York 38, N. Y.
Write for free descriptive Bulletins.
Also builders of coal and ore bridges, bulk material unloaders, bridge operating mechanisms, hoists and marine equipment, and specially designed machinery.

GUNITE dense—durable—high strength
PNEUMATICALLY PLACED CONCRETE

for — Swimming Pools
Fireproofing Structural Steel
Lining Steel Stacks & Bunkers
Repairing Docks, Dams & Bridges
Reservoirs Insulating Concretes
Water Main Lining Thin Walls
Sewer Repairs Lining Rock Tunnels
Pile Protection Prestressed Tanks
Stucco Coatings Pressure Grouting

We are Gunite contractors and engineers of long, extensive experience covering many hundreds of jobs.
Get in touch with us for complete engineering data and estimates on your problem.

GUNITE CONSTRUCTION CORPORATION
420 LEXINGTON AVE., NEW YORK 17, N. Y.
MURRAY HILL 3-7699

Plasteel

PRODUCTS

Presents

NEW LITERATURE

NO OBLIGATION!

- ENGINEERS
- ARCHITECTS
- CONTRACTORS
- MAINTENANCE MEN

Bring your building material reference files up-to-date! Now you can plan your new construction with the latest data — and with one of the nation's best—Plasteel Roofing and Siding — the only protected metal product that gives you the advantages of Mica!

Mail This Coupon Today!

PLASTEEL ENR 1-20-55
PRODUCTS CORPORATION
Washington, Pennsylvania

☐ Please send us new literature on Plasteel Roofing and Siding

Also send literature on

☐ Plasteel Insulated Panels
☐ Plasteel Roof Deck
☐ Plasteel Translucent Fiber Glass Panels

Company.....

Attention of.....*Title*.....

Street Address.....

City *Zone* *State*

UNIT PRICES

Road Cost per Mile in Africa

Road costs in underdeveloped areas, combined with variations due to differences in terrain or physical features come from the East African Association of Engineers via The International Road Federation Ltd., London.

An overall cost of £15,000 a mile includes bridges but not engineering fees for the Namanga-Taveta road just south of the Kenya-Tanganyika border. This has a formation width of 30 ft and a blacktop 18-ft carriageway between flush margin stones. It is designed to carry traffic safely at 60 mph, normal wheel loads up to 7,000 lb and higher wheel loads at less frequency. Maximum gradient is 1 in 15 and sight distances are 600 ft.

Cost per mile

Namanga-Taveta Road, East Africa

Miles from Namanga	Earth-works & sub-base	Base-course & surfacing	Drain-age	Bridges	Total#
	£	£	£	£	£
0–38	2,225	3,265	1,370	250	7,110
38–64	4,480	3,745	2,915	.....	11,140
64–80.5	5,295	4,040	3,915	4,440	17,690
80.5–104.5	2,170	3,210	780	275	6,435
104.5–113	3,775	3,510	1,400	7,040	15,725
113–116	3,410	6,600	3,920	2,690	16,620*

 # Add £1,165/mi for "preliminaries and general" and £3,980/mi for the effect of cost rises, devaluation and currency fluctuations, a total of £5,145 (April, 1954).

***Includes two roundabouts.**

Indiana Sewerage Is Under Estimate

Frankfort, Ind., opened 16 bids Oct. 27 on sewers and nine on additions to a treatment plant. Low base bids totaled $770,190, 13% less than the estimated $889,121. Consulting engineers are Paul J. Kleiser & Associates.

Engineering Construction Corp., 8% under second-low bid on Contract "A," has 365 days to complete piping, manholes, and miscellaneous work. Curry Construction Co. under Contract "B" has 380 days to add to and remodel an existing treatment plant.

With 1950 population at 15,000, the plant's design population is 35,000; flow 3.5 mgd. Its new structures will include primary settling basin 42x92 ft, final settling basin 18x75 ft, 2-story and basement sludge process building 20x50 ft, 50-ft diameter digestion tank.

Minimum wages are: $3.00 per hr to operating engineers, $2.50-$3.00 to skilled labor. Semi-skilled labor gets $2.20 plus $0.75 welfare; common $1.95 plus welfare.

Bidders include:

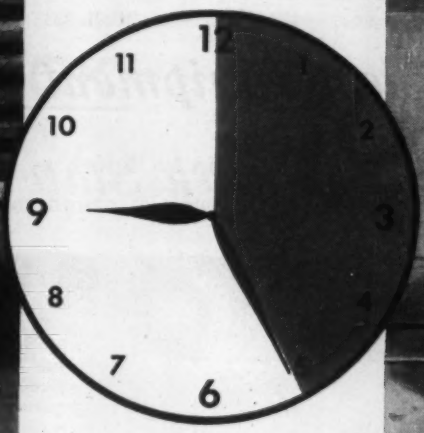
1C	Engineering Constr. Corp., Logansport, Ind.	$277,190*
2	Excavating Engineers Inc., Marion, Ind.	300,049
16	Raleigh Burk, Indianapolis, Ind.	594,914
EE	Paul J. Kleiser & Assoc., Terre Haute, Ind.	350,141

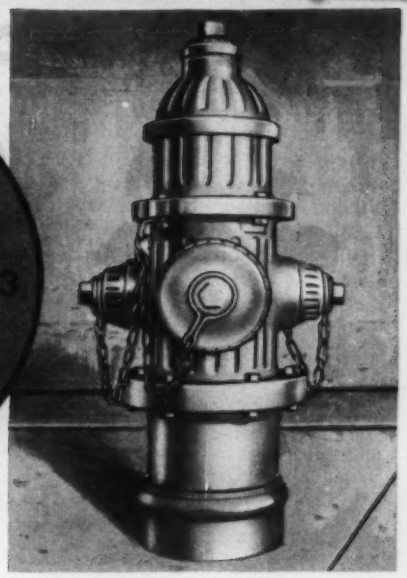
Bids: 10-27-54 Item, Contract "A"	Unit	Quantity	Unit Prices 1 C	2
Furnish only				
VCP sew 12" SS	lf	920	$1.07	$1.188
ES	lf	350	1.60	1.67
10" SS	lf	10,300	0.83	0.924
ES	lf	2,000	1.11	1.17
8" SS	lf	46,000	0.60	0.616
ES	lf	1,500	0.83	0.84
Wye, 3' long, 6x8"	lf	1,300	0.873	0.821
6x10"	lf	250	1.31	1.232
6x12"	lf	20	1.683	1.584
Exc, lay & backfill				
VCP 12" at 0-8'	lf	280	2.50	1.65
8-10'	lf	200	2.50	2.21
10-12'	lf	440	2.75	2.58
12-14'	lf	350	3.00	2.94
10" at 0-8'	lf	4,600	2.00	1.65
8-10'	lf	2,400	2.00	2.21
10-12'	lf	3,800	2.20	2.58
12-14'	lf	1,000	2.20	2.94
14-16'	lf	430	2.50	3.67
16-18'	lf	70	3.00	5.73
8" at 0-8'	lf	22,000	1.70	1.65
8-10'	lf	17,600	1.70	2.21
10-12'	lf	6,600	1.90	2.58
12-14'	lf	1,200	2.00	2.94
14-16'	lf	100	2.50	3.67
Exc, lay, bkfl & CIP				
CIP 8" at 0-8'	lf	180	4.00	5.12
8-10'	lf	100	5.00	5.73
force main	lf	1,650	3.60	5.08
Brick manholes, std				
Depth 0-8'	ea	103	240.00	223.75
8-10'	ea	64	290.00	236.00
10-12'	ea	34	338.00	273.75
12-14'	ea	6	360.00	298.75
14-16'	ea	2	430.00	323.75
16-18'	ea	1	485.00	418.50
Miscellaneous				
Repair 15" creek crossg	ls	1	5,000	1,485
2 MH	ls	1	2,500	1,000
F&i 8" 1/8 bends	ea	500	2.00	1.64
VC riser pipe	lf	600	1.75	0.4095
Conc "C" in cl 2 cradle	cy	100	25.00	12.50
3 encase	cy	10	35.00	12.50
Wood sheeting	Mfbm	6	300.00	150.00
Spec fill material	cy	200	2.00	1.25
Rock exc	cy	50	25.00	10.00
Cr stone or gravel	cy	3,000	1.75	2.40
4" farm underdrain tile	lf	1,000	0.45	0.15
Bit pvmt replace	sy	12,000	1.50	3.00
9" RC pvmt "A"	sy	1,400	9.00	5.357
Conc sidewalk repl, 4"	sy	400	5.40	4.375
Alternates				
Spec jt matl in lieu of cement grout slip seal jt p 12"	lf	.....	0.20	No bid
10"	lf	.....	0.15	.....
8"	lf	.....	0.10	.....
Segmental conc block in lieu brick for MH	vf	.....	4.00	.....
"B" MH cov in lieu "A"	MH	.....	5.00	.....

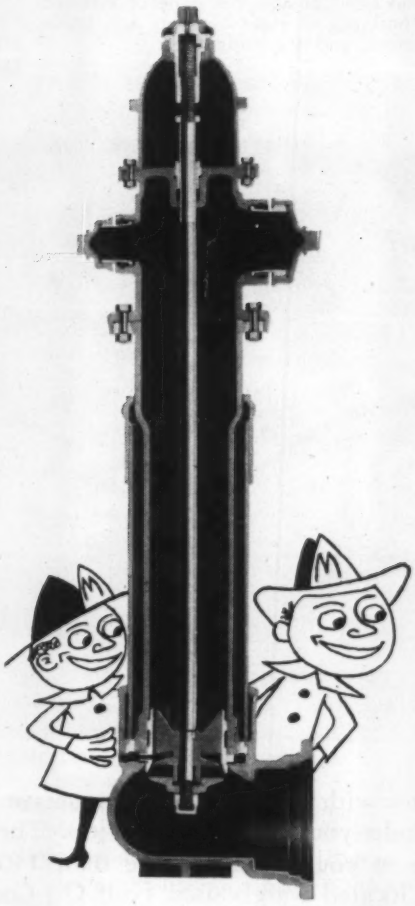
1C	Curry Constr. Co., Bloomington, Ind.	$493,000*
3**	The Weisbach Corp., Philadelphia, Pa.	498,000
9	L. I. Griffin & Sons, South Bend, Ind.	599,643
EE	Paul J. Kleiser & Assoc., Terre Haute, Ind.	538,980

Item, Contract "B"	Unit	Unit prices 1 C	3**
Sewage treatment plant	ls	$454,000	$448,000
Pump station NW	ls	18,000	25,000
SE	ls	21,000	25,000
Alternates			
Aluminum in lieu brick digester walls	ls	No bid	No bid
Wood doors for util bldg	ls	−1,200	.....
Insul brick side panels, Flintkote	ls	−700	.....
Blast furnace slag	ls	No change	.....
Supplementary items			
Conc in place "A"	cy	75.00	85.00
"B"	cy	72.00	65.00
"C"	cy	30.00	40.00
Gravel or cr stone fill	cy	3.50	5.00
Reinf steel	lb	0.15	0.15
Exc, rock	cy	18.00	15.00
earth	cy	2.00	3.50

***Base bid.**
****Second-low bid is irregular.**







Replaced in less than half an hour

WITHOUT EXCAVATING

The Mathews Modernized Hydrant is the leader in its field because it is simple in design and quickly accessible for repair or replacement. Here are some of the outstanding features of the Mathews Modernized Hydrant.

The Replaceable Barrel. Contains all working parts and can be replaced with another in jig time *without excavating*. When the hydrant is broken in a traffic accident, fire protection is interrupted for less than 30 minutes!

Compression-Type Main Valve. The Mathews Hydrant uses water pressure to help tighten the valve. No leaks, even when the hydrant is bowled over by a truck.

Stuffing Box Plate. Cast integral with the nozzle section, eliminates an extra part and a flange joint. A stronger, safer, leakproof construction.

Operating Thread. The stuffing box plate prevents water and sediment from reaching the operating thread. No rust can form. No ice can jam it in cold weather.

All these other quality features: Head turns 360° simply by loosening bolts • Replaceable head • Nozzle sections easily changed • Nozzle level can be changed without excavating • Protection case of "Sand-Spun" cast iron for strength, toughness, elasticity • A modern barrel makes an old Mathews good as new • Mechanical joint pipe connections optional

Send for this 80-page catalog. It contains full information about the R. D. Wood line of Cast Iron Pipe, Fire Hydrants, Gate Valves, and Hydraulic Machinery.

MATHEWS HYDRANTS

Made by R. D. Wood Company

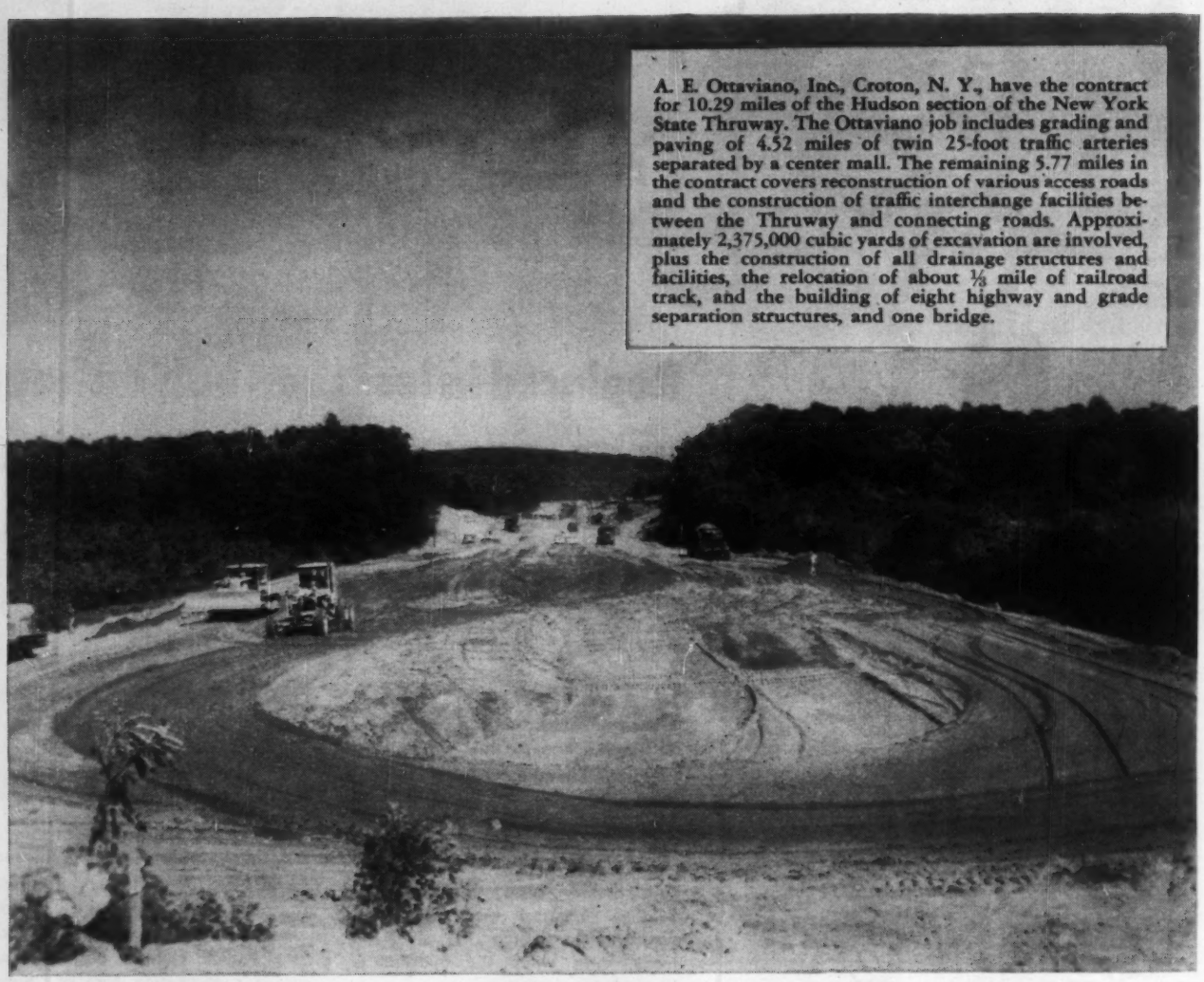
Public Ledger Building, Independence Square
Philadelphia 5, Pa.

Manufacturers of "Sand-Spun" Pipe (centrifugally cast in sand molds) and R. D. Wood Gate Valves

GULF PRODUCTS *and* FINE SERVICE

keep equipment rolling

on New York State Thruway



A. E. Ottaviano, Inc., Croton, N. Y., have the contract for 10.29 miles of the Hudson section of the New York State Thruway. The Ottaviano job includes grading and paving of 4.52 miles of twin 25-foot traffic arteries separated by a center mall. The remaining 5.77 miles in the contract covers reconstruction of various access roads and the construction of traffic interchange facilities between the Thruway and connecting roads. Approximately 2,375,000 cubic yards of excavation are involved, plus the construction of all drainage structures and facilities, the relocation of about ⅓ mile of railroad track, and the building of eight highway and grade separation structures, and one bridge.

THE New York Thruway is another tremendous and important project where Gulf tops the list of suppliers of petroleum products. Twenty leading contractors on the Thruway, with a total of 43 jobs, rely on Gulf to help keep equipment delivering top performance.

A. E. Ottaviano, Inc., for example, know from experience that Gulf quality lubricants provide better protection against mechanical delays. And that Gulf fuels help them gain an extra margin of engine power and efficiency. Then too, they appreciate the helpful engineering counsel that Gulf provides, as well as Gulf's prompt delivery service.

Let us discuss with you how Gulf products and service can help you on your next job. They are available to you through more than 1400 conveniently located warehouses. Gulf Oil Corporation · Gulf Refining Company, 1822 Gulf Building, Pittsburgh 30, Pennsylvania.

GULF

support

Junior

Achievement

Junior Achievement Week
January 30-
February 5, 1955

THE LONGER LOOK:

Trend to bigger houses is shown in detail by new government figures. The three-bedroom house is now far ahead

Houses are getting bigger. Most builders have observed this trend in their own areas. New government statistics now show just how strong the trend has been throughout the United States.

• Almost 60% of the nonfarm one-family houses started in the first three months of 1954 had three bedrooms and another 5% had four or more. By comparison, of the houses started in the first half of 1950, only 33% had three bedrooms and 1% more than three (chart, below).

• The two-bedroom house which dominated the new-homes market in the first half of 1950 accounted then for 65% of the starts. It slipped to only 32% of the starts in the first quarter of 1954.

• In all sections of the country, at least 55% of the new homes started in the early months of 1954 had three or more bedrooms. In 1950, these larger houses accounted for as many as 40% of the starts only in the northeast and northwest areas.

• Average floor area of new single-family houses in the first quarter of 1954 was 1,140 sq ft. In the first half of 1950, the average was only 983 sq ft. The 1954 average size, by the way, represents a return virtually to the prewar 1940 average of 1,177 sq ft.

• Smaller size prevails in dwelling units in multi-family structures (five or more families). In such structures started in the first quarter of 1954, fewer than 14% of the units had three or more bedrooms, 49% had one bedroom and 11% none.

These new statistics on the characteristics of new housing in the first quarter of 1954 are the result of a survey conducted by the U. S. Bureau of Labor Statistics. The sample covered about 5,000 residential projects with more than 30,000 units. Rough comparisons with the first half of 1950—the record year for housing starts—can be made from the Materials Use Survey, published by the Housing and Home Finance Agency in 1952.

• **The vanishing basement**—Larger house sizes, however, have not restored the popularity of basements. Only 36% of single-family houses started in the first quarter of 1954 had full basements, the same as in the first half of 1950. And there was little change in the number with partial basements—5% in 1954 compared with 3% in 1950. In the South and West, about three-fourths of the new houses in early 1954 had no basement at all.

Basic external wall construction also seems to have undergone little change. In 1950 89% of the new houses had wood frames, the same percentage as in 1940. Masonry provided the basic external wall construction in 11%. In 1954 masonry was reported for 13% of the single-family houses and wood frame for nearly all the rest. Masonry is most popular in the South (19%) and least popular in the Northeast (8%).

• **Aluminum window frames**—In window frames, there has been a noticeable shift to aluminum. In early 1954, aluminum was reported for all or a majority of frames in 18% of the one-family houses, up from only 5% in 1950. Steel dropped from 22% in 1950 to 19% in 1954, and wood from 69% to 61%.

Masonry construction dominated the multi-unit structures started in the first quarter of 1954, accounting for 53%. In the Northeast the percentage was 88, with 44% solid brick and another 44% brick facing. In the north central and western regions, however, about 90% were reported to be of frame construction.

Metal window frames also were more popular in multi-unit structures 29% reporting steel and 27% aluminum frames.

• **Reasons**—The move to bigger houses—roughly from one-third of the starts having three or more bedrooms in 1950 to two-thirds in early 1954—can be attributed to a combination of factors. Probably the most important are:

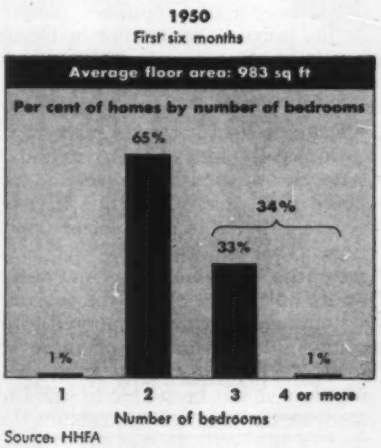
Bigger families. The postwar baby boom hit a new high in 1954, the first year when more than four million babies were born in the United States. The arrival of second, third and fourth children has made a lot of two-bedroom houses inadequate.

Higher incomes. The number of families with incomes of $5,000 and over increased 50% in the five-year period beginning with 1949, according to estimates by MacFadden Publications, Inc. This has enabled many families to upgrade their housing to bigger homes.

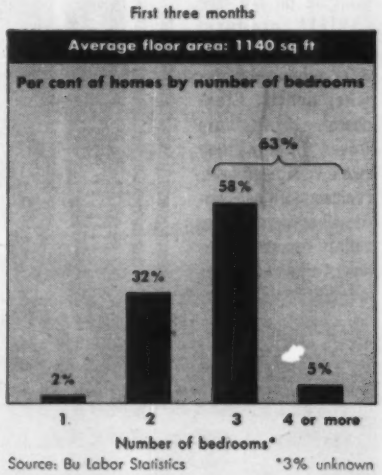
Better bargains in housing. Despite the increased size and improved quality of houses, builders are still able to construct them at prices that attract a wide market. The average (median) selling price of single-family houses started in the first quarter of 1954 was only $12,300, and 70% were built to sell at less than $15,000.

(B&F continued on page 78)

Houses are getting bigger:



Source: HHFA



Source: Bu Labor Statistics *3% unknown

"What do you mean you can't get good prints?"

Don't expect the Blueprinter to produce sharp prints from poor tracings. Be sure! Switch to graphite-saturated

IMPORTED CASTELL

Wood pencil or Impor'ed 9030 Lead and LOCKTITE Holder with new gun-rifled vice-like clutch. (pat. appd. for).

Picture of an indignant man who forgot that poor pencils produce poor tracings—and poor tracings produce poor prints.

Save yourself money and manhours by converting 100% to imported CASTELL, the drawing pencil that lays down more graphite on the line. CASTELL produces cleaner prints, many more prints than any other pencil. Giant aircraft plants have proved it with their own independent tests. Pennies more per pencil will save you many dollars, much irritation. Call your Dealer today.

A.W. FABER-CASTELL
PENCIL CO., INC. NEWARK 3, N. J.

Clay Report Gets Going-Over At Highway Finance Meeting

Chamber of Commerce conference serves as sounding board, indicating points on which opposition is developing

The Clay Committee's recommendations for solution of our highway problem are not going to have clear sailing in Congress, even though the Clay program, with some modifications, is likely to be adopted. Also it may be another two years before most of the states will be able to fall into line—unless state legislatures are called into special session. Meanwhile, unless Congress decides on the Clay program quickly, toll-road financing is going to slow down for awhile.

These are the conclusions to be drawn from discussions at the two-day conference on highway finance held in Washington last week under the auspices of the U.S. Chamber of Commerce. Participating were state and federal highway officials, congressmen, highway engineers and contractors, traffic and safety experts, and representatives of citizens' groups and of industries with a stake in the highway problem.

The meeting was well timed, for the Clay committee had only just presented its report to President Eisenhower (Page 23). And, it served to indicate the sources of potential opposition to the program.

• **The revenue principle**—In the first place, the principle of backing federal securities with the gas-tax revenue has already been attacked by Senator Byrd, Virginia's conservative Democrat. But it is significant that this "revenue principle" was almost universally accepted by those attending the Chamber of Commerce meeting. At the previous conference in December 1953, however, the idea aroused considerable controversy.

• **Refunds**—In the second place, it was clear that the idea of giving refunds to states for already-completed and proposed toll roads on the interstate system is going to get a lot of opposition. This will come from: (1) The American Automobile Assn., which wants no tolls at all on the interstate system, and is strongly opposed to encouraging construction of more toll roads. (2) Congressmen from states which have not been able to build toll roads or up-to-date free roads on their part of interstate system.

It is likely that such opposition to refunds will result in a compromise—the percentage of refund will be cut down. But the refund principle is not likely to be eliminated entirely. The reason is entirely practical: Unless some credit is given to states that build toll roads, a great many existing plans would stop abruptly. The roads would eventually be built as free roads, of course. But there would be delays—a year, 18 months, perhaps longer. And the Administration is anxious to avoid delay.

• **Toll-road effect**—In the third place, the Clay program already is getting opposition from members of toll-road commissions. H. E. Bailey, general manager of the Oklahoma Turnpike Authority, offered a counter-proposal at last week's conference. He suggested a national turnpike authority that would have exclusive responsibility for development of the interstate system, both through state turnpike agencies and directly. Federal funds could be used to strengthen the credit of marginal toll-road projects—an idea ruled out by the Clay program.

An approach of the sort Bailey proposed would have the effect in some states of cutting state highway departments completely out of the interstate highway program. Under the Clay program, the Federal Highway Corp.

Spending and Financing Schedule For Interstate Highway Program

	Construction expenditures (in millions)			
Year	Total	From federal gas revenues & oil tax revenues	From bond sales	Possible bond maturities in years
1956	$1,000	$500	$500	11
1957	2,000	500	1,500	13
1958	2,500	600	1,900	15
1959	2,700	500	2,200	17
1960	2,900	500	2,400	19
1961	2,900	500	2,400	20
1962	2,900	500	2,400	21
1963	2,900	400	2,500	21
1964	2,700	400	2,300	22
1965	2,500	365	2,135	22
	$25,000	$4,765	$20,235	

would operate through state highway departments. But in most states where toll roads exist, they are operated more or less independently of state highway departments. It has long been obvious that large-scale federal aid to the interstate system might create a pitched battle between toll-road agencies and highway departments.

• **What about the states?**—The Clay report proposes that the federal government pay for about 30% of our total highway needs of about $101 billion over the next decade. But in last week's discussion, it was often remarked that the Clay report was discreetly silent on how states and local governments can deal with the problem of financing their share of highway construction, beyond what had already been considered for the next 10 years.

The Chamber of Commerce discussions also made it quite plain that the worst part of the highway program right now is in U. S. cities. The Clay report offers little to solve downtown congestion; and this aspect of the highway problem appears likely to get worse.

Though the Clay report was silent about the role of states and local governments, some observers at the Chamber of Commerce meeting were ready with advice to fill in this gap. Most states will have to sell revenue bonds based on their gas taxes to get the money to meet their highway needs. And for quite a few, the arithmetic of the situation makes it apparent that they will have to raise their gas taxes in order to get sufficient security to sell all the bonds they need.

Alcan Will Sell $24 Million Of Surplus Kitimat Equipment

The Aluminum Co. of Canada has announced a huge sale of surplus construction equipment, believed to be the largest ever undertaken by private industry. Through its sales agent, S&S Machinery Co., of Brooklyn, N. Y., Alcan will dispose of over $24 million of construction and mining equipment used during the past few years in building its vast hydroelectric and aluminum smelter project at Kitimat in British Columbia.

With the initial phase of this job now over, a tremendous amount of equipment is available: anything from mammoth shovels and cement batch plants to compressors, locomotives, and helicopters. The equipment is available for inspection at the site, either directly or through engineering agents.

Greatest buy in HEAT

300,000 BTU's

$325 ELECTRIC DRIVE

$350 GASOLINE ENGINE DRIVE

F. O. B. FACTORY

for CONTRACTORS, INDUSTRIAL PLANTS, FARMERS, ROAD BUILDERS

Compact, portable, safe and efficient, the oil fired Clayton Salamander supplies clean, odorless hot air at high velocity . . . at the rate of 2400 cu. ft. per minute . . . for heating space, drying out new construction, thawing frozen ground, aggregates and equipment, removing snow and preventing the freezing of wet concrete while curing. Hundreds of other uses.

Made in two models of identical capacity, 300,000 BTU's per hour. Gasoline engine drive for 100% portability and remote use; electric drive for general utility. Burns less than 2¼ gals. kerosene or stove oil per hour. Made by Clayton Manufacturing Company, leaders in combustion engineering and building of package type steam generators. Write for complete literature.

SPACE HEATING • PAVING CURING • SNOW REMOVAL • MATERIALS AND GROUND THAWING • PAINT DRYING

CLAYTON MANUFACTURING CO.

BOX 550, EL MONTE, CALIF.

SOME TERRITORIES OPEN FOR EQUIPMENT DISTRIBUTORS

Goldblatt

"fresno" concrete trowel

$11.50

f.o.b. Kansas City, Mo.

1056 tools

FREE TOOL CATALOG—1,056 tools for trowel trades. 100-page illustrated book. Send name on postcard.

Exceptionally fine quality single-action "Fresno" trowel. Preserves balance despite roughest use. Tempered, ground and polished spring-steel blade is permanently riveted to sturdy aluminum mounting. Includes 6-ft. Ash handle with heavy steel ferrule. Fully adjustable. 30"x5" trowel size, order No. 30-SA. Check, money order or C.O.D. Fully guaranteed.

GOLDBLATT TOOL COMPANY, Dept. G1
1928 Walnut, Kansas City 8, Mo.

PUMPING PROBLEM?

Predrain with a

MORETRENCH WELLPOINT SYSTEM

Dependably enables you to dig "In the Dry." Speeds jobs — saves money.

CATALOG ON REQUEST

MORETRENCH CORPORATION

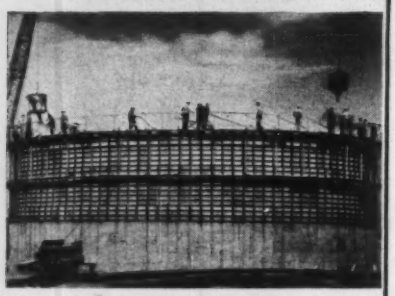
90 West St., New York 6, N. Y.
Chicago, Ill. • Tampa, Fla.
Houston, Tex. • Rockaway, N. J.

UNI-FORM
Concrete Forms

3 SIMPLE ELEMENTS FORM ANY CONCRETE STRUCTURE

UNI-FORM Concrete Forms are prefabricated steel-framed, plywood faced panels . . . ready to use when they reach the job.
UNI-FORM Ties and Keys lock and spread Panels into an automatically accurate form. No measuring — no guesswork. Completely versatile . . . they form straight, battered, circular, irregular or curved walls at lowest all around cost.

Rented . . . Sold . . .
Rented With Purchase Option



HIGH SPEED CIRCULAR WALL FORMING

UNI-FORMS provide faster, simpler and easier circular wall forming . . . one side alignment and bracing . . . absolute control of concrete, and safer, cleaner working areas.

Write for the UNI-FORM Catalog and complete details

UNIVERSAL FORM CLAMP CO.
1238 N Kostner Ave
Chicago 51, Illinois

Ribicoff Steps in

New governor checks into Connecticut's Expressway

Connecticut's new governor, Abraham A. Ribicoff, has stepped right into the financing of the Connecticut Expressway. The governor wants a re-appraisal, and has appointed a group of financial experts to do the job. The committee includes three officers of Hartford life insurance companies, a savings banker, and an officer of a Wall Street commercial bank.

There are several things Ribicoff objects to:

- The state has pledged its gas-tax revenue to support Expressway bonds for 40 years. This, of course, limits the state in its use of the gas-tax revenues for other purposes.
- Construction cost of the Expressway is relatively high—$2,461,000 per mile, while the proposed toll rate of about 1-cent per mile is relatively low compared to other toll roads. The per-mile cost is certainly explained in part at least by the expense of land acquisition. But outside financial experts believe that the low toll rate does seem to give some justification for Ribicoff's complaint that out-of-state drivers are being favored at the expense of Connecticut residents.
- Instead of higher tolls, the state is responsible for maintenance costs of about $2.5 million per year, and plans to build access roads amounting to about $18 million. Ribicoff believes this also tends to favor out-of-state drivers.

The governor wants to consider whether or not revenues from all toll roads and bridges in the state could be pledged against the Expressway bonds instead of the state gasoline tax. As part of this, tolls on the Merritt and Wilbur Cross Parkways might be increased.

Busy, Competitive Year Seen For Equipment Distributors

Business will be good for construction equipment distributors this year, but competition will be tougher. That's the consensus of opinion among dealers, according to a survey just made by Associated Equipment Distributors.

AED finds general optimism about construction activity and sales of new equipment. New York, New Jersey, and Pennsylvania are the only areas where forecasts of construction activity tend to be conservative. Most distributors expect this year's sales to make an upswing, coming back into line with the general construction picture. This attitude is general in all areas except New York and the Pacific Northwest.

Dealers agree that competition in 1955 will be the toughest in years. Many are worried that profits will shrink as a result. While they report that inventories of new equipment are normal, used equipment in inventory is already above normal. They feel that used-equipment prices will tumble even lower as the months go on. The new depreciation schedules allowed by the new tax law are making used machinery less attractive to buyers, and this effect already has been noted in many parts of the U.S. The only bright spot in the used-equipment picture is found in the Middle Atlantic states.

Starts Were Over 1.2 Million In 1954, and Boom Rolls on

Housing starts for 1954 totaled 1,215,000, according to estimates made last week by the Bureau of Labor Statistics. That's the second highest in history and 10% above 1953. Nearly all the units started were privately owned. Public starts dropped to only 19,400 in 1954, down 45% from 1953 and the smallest total since the Housing Act of 1949 went into effect.

In December, starts declined seasonally to 89,600. However, this was a record for the month, and also 40% above December 1953. Seasonally adjusted, the December starts were at an annual rate of 1,473,000, well above the record annual total of 1,396,000 in 1950. That means the homebuilding boom is still rolling in high gear as the new year commences.

Industrial Builders Look Forward to a Good Year

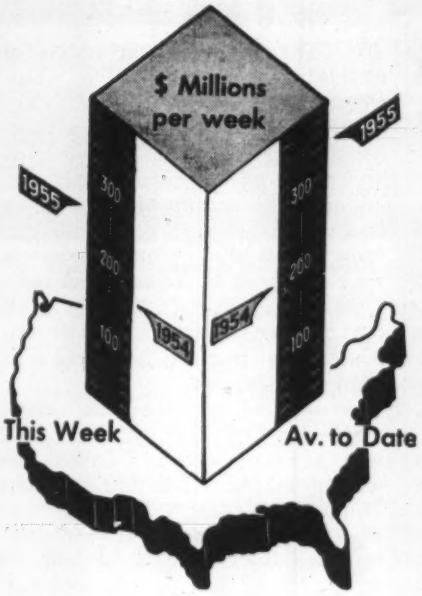
This year should be "another good year" for industrial builders, though not as busy as the record-breaking period just after Korea. This is the forecast made by engineers and contractors who attended last week's annual meeting of the National Constructors Assn. in New York City.

The association is made up of firms engaged in design and construction of industrial plants—primarily chemical plants, steel mills, oil refineries, and power plants.

John F. O'Connell, president of the group, said that volume of new industrial contracts has been increasing since the start of the fourth quarter. (ENR forecasts a 6% gain in industrial contracts this year.)

Activity This Week

As reported to ENR
(In millions of dollars)



Amount of contracts let

	This Week	Cumulative 3 wks 1955	1954	% chge
Federal	$10.2	$135.8	$52.0	+160
State and municipal	83.2	255.1	271.5	−6
Total public	93.4	390.9	323.5	+21
Total private	163.8	645.9	271.8	+138
U. S. total	$257.2	$1,036.8	$595.3	+74

Contracts by type of work

Waterworks	$8.3	$23.1	$12.8	+80
Sewerage	4.4	19.5	12.0	+63
Bridges	4.5	30.4	24.0	+27
Highways	22.6	96.1	90.9	+6
Earthwork, waterways	4.9	15.6	26.7	−42
Buildings:				
Public, excl. hsg.	35.1	141.6	112.9	+25
Housg., public	1.6	2.2	17.3	−87
Housg., private	107.9	343.2	141.0	+143
Commercial	23.9	71.0	50.5	+41
Industrial	20.0	209.9	71.7	+193
Unclassified	24.0	84.2	35.5	+137
Total	$257.2	$1,036.8	$595.3	+74

NOTE: Minimum size projects included are (effective Jan. 1, '55): Waterworks and waterways, $44,000; other public works, $73,000; industrial buildings, $93,00; other buildings, $344,000.

New capital for construction

(millions of dollars)

	Week of Jan. 13 1955	Cumulative 2 wks 1955	% chge '54-'55
Corporate securities	$33.1	$39.9	−48
State and municipal:			
All except housing	39.2	59.3	+1
Housing	7.2	10.6	+1078
Federal loans	4.3	6.2	+68
Federal aid	...	...	...
Total non-federal	$83.8	$116.0	−18
Federal appropriations:			
In U. S.	...	...	...
Outside U. S.	...	...	...
Total new capital	$83.8	$116.0	−18

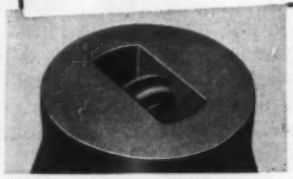
ENR cost and volume indexes, 1955

		Base years = 100 1913	1926	1949
Construction cost	1/13	645.17	310.13	135.25
	12/30/54*	644.32	309.72	135.07
Building cost	1/13	458.76	247.99	130.41
	12/30/54*	457.91	247.53	130.17
Volume	Dec.	464	189	134
	Nov.	522	212	151

* Official ENR index for Jan. 1

Frederick
CAST SEMI-STEEL
BALLS

Your low cost production tool for
■wrecking old buildings ■smashing scrap metal
■smashing old paving ■secondary quarry breakage



Exclusive E-Z SWING steel eye, deeply imbedded in ball, gives better control; more cable protection. Special Release Hooks for "free dropping" also available.

Tough and rugged, they're made to stand abuse without maintenance cost. Made in sizes to suit your needs. Prompt shipment F. O. B. Frederick, Md., from stock. Write today for free illustrated literature and prices on Frederick Balls and Weights that save your production costs.

SIZES AND WEIGHTS SHIPPED FROM STOCK

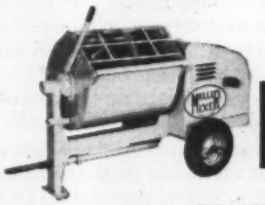
500 lbs. (ball-shaped)	2000 lbs. (ball-shaped)	5200 lbs.
1000 lbs.	3300 lbs.	6500 lbs.
1500 lbs.	4000 lbs.	8000 lbs.

MAKERS OF MANHOLE FRAMES, COVERS AND STEPS
• STORM GRATINGS • METER FRAMES AND COVERS
• CENTRIFUGAL PUMPS • GRAY IRON CASTINGS

FREDERICK IRON & STEEL, INC.
FREDERICK, MARYLAND

MULLER MIXERS and POWER TROWELS
set quality standards in their fields

Muller's earliest objective—to make the best possible plaster and mortar mixer and sell it for the lowest possible price—was achieved by: (1) specialization on a few models . . . (2) careful selection of materials and components . . . (3) experienced workmanship . . . (4) sound distribution methods. Other Muller Machines, also, rank high in their fields for the same reasons.

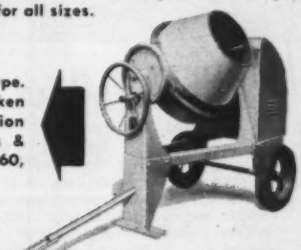


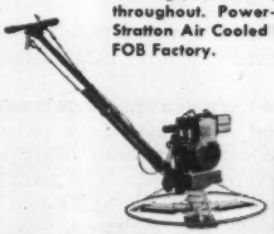
PLASTER AND MORTAR MIXERS

Made in 2, 3½, 6, 6 to 8, and 9 cu. ft. sizes. Electric motor or gas engine power. All models have Muller Lifetime Paddle Shaft Seal to protect bearings. Power throwouts on smaller models, built-in disc clutch on larger. Many other features. Priced $180 to $996 FOB Factory. Rubber scraper blades are available for all sizes.

CONCRETE MIXERS

3 models, 3 to 6 cu. ft. capacities, tilting type. Ample size drums, fast mixing action, Timken Bearings, electrically welded, sturdy construction throughout. Power—electric motor or Briggs & Stratton Air Cooled Engines. Prices $230 to $660, FOB Factory.





POWER TROWELS

2 sizes—29" diameter, 1¾ HP; and 34", 2¼ HP Briggs & Stratton Engines. Stationary guide ring eliminates hand troweling when finishing along baseboard. Engine speed regulated by governor control on handle.

SEND FOR INFORMATION FOLDERS AND NAME OF LOCAL DEALER

MULLER MIXER MULLER MACHINERY COMPANY, Inc.
Metuchen 21, New Jersey
Cable Address MULMIX

Get 4 BIG ADVANTAGES

with Servicised

White Pigmented Concrete Curing Compounds

1. **Fast, positive coverage...no missed spots**
2. **Reflects heat—reduces concrete temperatures 15° F.**
3. **Saves material...no waste or overlap**
4. **Does not run on sloping surfaces—"stays put" after application**

Servicised White Pigmented Curing Compound is widely used in areas where atmospheric temperatures exceed 80° F. because it produces a membrane capable of reflecting heat to reduce concrete temperatures as much as 15° F. Even application, using minimum material and application time. May be sprayed or brushed.

Write for complete details and circular on Servicised Concrete Curing Compounds.

SERVICISED PRODUCTS CORPORATION
6051 West 65th Street, Chicago, Illinois

SAVE TIME AND FLOOR SPACE

KINNEAR Rolling Doors

Kinnear Rolling Doors open upward. They coil *compactly* above the opening. Surrounding floor, wall and ceiling space is *always fully usable.* The interlocking-slat curtain (originated by Kinnear and famous for over 50 years) give *all-steel protection* against fire, storms, rioters. Manual or motor operation. Built to fit any opening. Write for new catalog.

The KINNEAR Manufacturing Co.
1820-40 Fields Ave., Columbus 16, Ohio
1742 Yosemite Ave., San Francisco 24, Calif.

KINNEAR ROLLING DOORS
Saving Ways in Doorways

LABOR

Western Bargaining

Puget Sound is losing Pacific Northwest lead

Collective bargaining negotiations, underway in the Pacific Northwest construction industry, no longer look to the Puget Sound area for the cue either in timing settlements or in the scope of demands. This year, agreements were reached with operating engineers in both Portland and Spokane while Seattle negotiations were still in progress.

Current negotiations establish no particular pattern. Differentials between traditionally higher rates in the Seattle-Tacoma area and rates in other areas are diminishing. Interest in fringe benefits and extension of agreement coverage continues.

Significant observations emerging from negotiations are:

• Stiff contractor resistance to welfare programs is developing in the Spokane area. Contractors have become increasingly price conscious and feel that "negotiations must consider the best interests of the industry, rather than individual unions."

• Contractors in the Seattle area are seeking two-year contracts wherever possible. Period of duration has varied as to unions and areas and in many cases contracts have run for three years. Both operating engineers and contractors in the Spokane area have expressed dissatisfaction over previous three-year contracts and prefer a shorter period.

• Portland contractors foresee both building and heavy construction eventually coming under one wage scale and one agreement. The gap between the two has continued to close.

• Contractors in eastern Washington expect emphasis in the future on negotiation of maintenance rates. They believe "maintenance by contract" is approaching as one means of keeping craftsmen and employers busy.

An ENR roundup reflects the following picture in three major areas.

• **Oregon**—Negotiations between laborers and AGC have been reduced to new contracts in both heavy and building construction. New rates for heavy construction are $2.13 plus 10 cents health and welfare (increased from $2.10 and .07½). For building construction, they are $2.23, inclusive of 10 cents in lieu of health and welfare (an increase from $2.17 and .07). The union has the option of establishing a welfare fund to which the 10-cent payment may be made. Contracts are for three years, with reopening for wages late in 1955 and 1956, incorporate transportation allowances now paid to AFL carpenters, and make no changes in overtime pay (now double time except for concrete work which is at 1½ on weekdays). Operating engineers have won a 5½-cent increase. Negotiations with carpenters and structural ironworkers are nearing completion.

• **Spokane**—Operating engineers have won a 5-cent increase. Lathers are seeking a 25-cent hike, 10 cents for health and welfare, a 7-hour day and an apprentice program at employers' expense. Bricklayers are seeking increases from 15 to 21 cents and plasterers an increase of 12½ cents. Ironworkers have named no increase and are striving for area-wide bargaining.

• **Seattle**—Wage rates and fringe benefits continue to be relatively higher in the Seattle area but the differential grows smaller. Cement finishers and laborers will continue through 1955 without an increase under existing two-year contracts. Carpenters received a one-cent cost-of-living increase Jan. 1. The Mountain Pacific Chapter of AGC is negotiating with operating engineers, teamsters and structural ironworkers. Wage increases are expected to be held down to a 5-cent level.

Workmen's Compensation Law No Aid to Prime Contractor

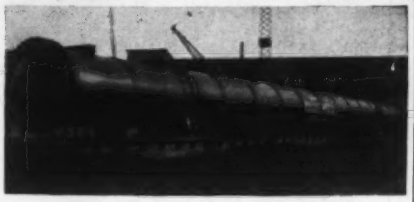
A decision of the Arkansas Supreme Court contains bad news for prime contractors—both in Arkansas and other states with similar workmen's compensation laws.

The court ruled that an injured employe of a subcontractor may sue the prime contractor for damages in a common-law tort action. Previous compensation for injuries by the subcontractor's insurer under workmen's compensation does not bar the suit.

Conscious that its decision places a prime contractor under a continuing potential liability, the court noted that relief could come only by a change in the law. For the existing law fails to give the prime contractor the same protection that is afforded the sub.

The prime contractor was The Baldwin Co. which had a contract for construction of a General Motors'

TIMBER-TREATING CYLINDERS



• Whatever your need in pressure vessels —creosoting cylinders, bubble-towers, gas scrubbers, pressure spheres, gas storage tanks, etc.—you can depend on COLE for vessels that are correct in design and permanently leakproof at the welded or riveted joints.

We also design and fabricate elevated tanks, acid tanks, dye vats, digestors, standpipes, storage tanks, etc. Write for latest Cole catalog—"Tank Talk."

Established 1854

R. D. COLE

MANUFACTURING CO.

NEWNAN, GA.

TANKS • TOWERS • VESSELS CYLINDERS

from

OFFICE MANAGER

to

GENERAL MANAGER

yes, that is the quality of the personnel available to your organization through the Classified Advertising pages of ENGINEERING NEWS-RECORD.

Classified Advertising Division

ENGINEERING NEWS-RECORD

330 W. 42nd St. New York 36, N. Y.

GUNITE

Since 1915

CONCRETE

SAND AND CEMENT "Placed by Air"

We have completed over 2800 exclusive GUNITE contracts including — LININGS ENCASING — INSULATING — REPAIRING NEW CONSTRUCTION.

Send for specifications and bulletins

See our catalog in Sweet's

GUNITE CONCRETE & CONST. CO.

1301 WOODSWETHER RD., KANSAS CITY 5, MO.
2016 W. WALNUT, CHICAGO 12, ILL.
3206 HOUSTON, HOUSTON 7, TEX.
St. Louis Milwaukee & Twin Cities Denver New Orleans Memphis

LABOR

building. An employe of a subcontractor, Southwestern Electric Co., fell into a pit and was injured. After getting his workmen's compensation benefits from the subcontractor's insurer, he sued Baldwin. And the court saw no reason why he couldn't.

The only time a prime contractor becomes an "employer" with respect to employes of a subcontractor, as the law now stands, is when the subcontractor fails to secure compensation required by the law. In that situation, an employe may recover under the act—but he could not then turn around and sue the prime contractor in a tort action.

Lower California Builders Agree to Union Surveying

Efforts to extend the activities of unionized civil and other professional engineering employes in California (ENR May 13, 1954, p. 28) showed evidence of success with a field survey agreement between Operating Engineers Local 12 and contractors in southern California.

The new agreement covers all field survey work except that performed by certain supervisory and office engineering personnel. It is the first of its kind to be obtained by the local and is a supplement to the basic agreement negotiated earlier this year between the union and four southern California contractor groups—AGC, BCA, HBI and the Excavating and Grading Contractors Assn.

Unlike the basic contract, the supplemental agreement affects only those member contractors who sign it. All members, however, having work falling within its provisions, must become parties to it.

Minimum wage scales established by the agreement are $2.52 for rod and chainmen, and $2.76 for instrumentmen. When instrumentmen perform tasks generally considered those of a chief of party, the rate is $3.05.

The union has had an agreement with the Southern California Civil Engineers and Land Surveyors Assn. since 1950.

Investigate Welfare Funds

Last week Graham Barden, House Labor Committee chairman, described union welfare funds (ENR Dec. 23, 1954, p. 50) as "a very sick patient." The committee's interim report discloses a wide range of "questionable" practices and Barden said the investigation will be continued.

OFFICIAL PROPOSALS

Bids: February 21, 1955

Contract HP-120.006

THE PORT OF NEW YORK AUTHORITY
HOBOKEN-PORT AUTHORITY PIERS
PIER A

Sealed proposals for the construction of Pier A at the Hoboken-Port Authority Piers will be received at the office of the Chief Engineer of The Port of New York Authority, Room 1100, 111 Eighth Avenue, New York 11, N. Y., until 2:30 P.M. on Monday, February 21, 1955, at which time and place said proposals will be opened and read.

Contract documents may be seen at the office of the Engineer of Materials of the Authority, Room 1112. Documents will be furnished upon deposit of $50.00 per set for not more than three sets to any one company (each set including one copy of the contract drawings). Additional sets will be furnished upon payment of $50.00 per set, which payment is not returnable. Deposits and payments shall be delivered to the Treasury Department, Room 1001, where a receipt in duplicate will be issued. A copy of the receipt shall be delivered to Room 1112, where the documents will be furnished.

Those who have submitted a bid on the contract will receive a refund of the deposit for each set of documents, not exceeding three, returned within forty days after the opening of proposals. Those who have not submitted a bid will receive a refund of one-half of the deposit for each set of documents, not exceeding three, returned within forty days after the opening of proposals.

THE PORT OF NEW YORK AUTHORITY
Howard S. Cullman, Chairman
New York, January 20, 1955

Bids: February 3, 1955

New Jersey Turnpike Authority

CONTRACT NO. N-10A

Proposals are invited for Contract No. N-10A which involves the construction of the concrete deck, and other work in connection therewith and incidental thereto, for the Newark Bay Bridge, extending from the East Abutment in the City of Bayonne, Hudson County, to Pier W45, just west of Doremus Avenue in the City of Newark, Essex County, all in connection with the construction of the Newark Bay-Hudson County Extension of the New Jersey Turnpike.

The principal items of work include:

Concrete	18,100 Cu. Yds.
Reinforcement Steel	4,475,000 Lbs.
Erecting Metal Railing	6,800 Lin. Ft.

Proposals will be received at the New Jersey Turnpike Authority, Administration Building, New Brunswick, New Jersey, until 11:00 O'Clock Eastern Standard Time on the morning of February 3, 1955, at which time and place said proposals will be publicly opened and read.

Each bidder must submit with his proposal a Contractor's Financial and Equipment Statement.

Contract documents may be examined during office hours after January 13, 1955, at the office of the Authority and at the office of the Consulting Engineers, Howard, Needles, Tammen & Bergendoff, 55 Liberty Street, New York 5, New York. Contract documents will be furnished upon payment of Fifteen Dollars ($15.00) for each set, upon application to the Authority. Contract documents are not required to be returned, and the payment will not be refunded.

NEW JERSEY TURNPIKE AUTHORITY
Paul L. Troast, Chairman
January 11, 1955

(Continued on following page)

OFFICIAL PROPOSALS
(Continued from preceding page)

Bids: February 8, 1955

Pennsylvania Turnpike Commission
Harrisburg, Pennsylvania

NOTICE TO BIDDERS

Sealed proposals will be received by the Pennsylvania Turnpike Commission, through the Chairman, 11 North Fourth Street, Harrisburg, Pennsylvania, until 10:00 a. m., Eastern Standard Time, the 8th day of February 1955, and immediately thereafter will be taken to the Public Utility Commission's Hearing Room No. 1, North Office Building, State Capitol, Harrisburg, Pennsylvania, and publicly opened and read aloud for the following contracts:

For the construction of structures and the grading, drainage and paving of the Turnpike Section 37-F, part of the Northeastern Extension of the Pennsylvania Turnpike in Bear Creek Township, Luzerne County, Commonwealth of Pennsylvania. This section being situated as follows:

Beginning at a point approximately 2,251 lineal feet southeast of the center line of Legislative Route 933 at Turnpike station 360+00 in Bear Creek Township, Luzerne County; thence in a northerly direction 18,925 lineal feet to Turnpike station 549+25, at a point approximately 6,165 feet northeast of the center line of Legislative Route 169 in Bear Creek Township, Luzerne County, a distance of 3.58 miles.

The approximate quantities of the principal items are as follows:

Class I Excavation	1,330,130 cu. yds.
Class II Excavation	18,009 cu. yds.
Class 2A Excavation	1,782 cu. yds.
Special Subgrade	194,360 sq. yds.
Reinforced Concrete Pavement	119,481 sq. yds.
Class A Concrete	1,695 cu. yds.
Class B Concrete	2,388 cu. yds.
Plain Steel Bars	404,886 lbs.
Fabricated Structural Steel	807,440 lbs.
Median Divider	17,793 lin. ft.

For the construction of structures and the grading, drainage and paving of the Turnpike Section 37-G, part of the Northeastern Extension of the Pennsylvania Turnpike in Bear Creek, Plains and Jenkins Townships, Luzerne County, Commonwealth of Pennsylvania. This section being situated as follows:

Beginning at a point approximately 5,990 lineal feet northeast of the center line of Legislative Route 169 at Turnpike station 547+50 in Bear Creek Township, Luzerne County; thence in a north northeasterly direction through a small equality 19,649 lineal feet to Turnpike station 744+00 at a point approximately 40 lineal feet northeast of the center line of an earth road leading to the Spring Brook Water Company reservoirs, in Jenkins Township, Luzerne County, a distance of approximately 3.72 miles.

The approximate quantities of the principal items are as follows:

Class I Excavation	982,496 cu. yds.
Class II Excavation	16,020 cu. yds.
Class 2A Excavation	2,790 cu. yds.
Borrow Excavation	648,247 cu. yds.
Special Subgrade	161,118 sq. yds.
Reinforced Concrete Pavement	101,990 sq. yds.
Class A Concrete	1,701 cu. yds.
Class B Concrete	3,854 cu. yds.
Plain Steel Bars	588,928 lbs.
Fabricated Structural Steel	1,033,400 lbs.
Median Divider	18,027 lin. ft.

Copies of plans, specifications and other contract documents including cross sections, are on file and open to public inspection at the office of the Pennsylvania Turnpike Commission located at Harrisburg, Pennsylvania, on 21 January 1955. Plans, specifications, cross-sections and other contract documents will be available by this date for inspection or for mailing to prospective bidders. Copies of Specifications for grading, drainage, paving and structures may be purchased from the Pennsylvania Turnpike Commission for the sum of five (5) dollars per copy. Copies of cross-sections may be purchased from the Pennsylvania Turnpike Commission for the sum of fifty (50) dollars per set, for each section.

Plans and contract documents, for each section exclusive of cross-sections and specifications, may be purchased from the Pennsylvania Turnpike Commission for the sum of twenty (20) dollars for each set. No refund will be made for plans returned unless the project is withdrawn from letting by the Pennsylvania Turnpike Commission.

Remittances are payable by check or P.O. money order to the Pennsylvania Turnpike Commission and must accompany requests for drawings, specifications, contract documents, and cross-sections.

OFFICIAL PROPOSALS

The Pennsylvania Turnpike Commission reserves the right to award each section as a separate contract or in a combined contract.

The character and amount of bid security to be furnished by the bidder is stated in the Instructions to Bidders.

The Commission reserves the right to waive any informalities in or to reject any or all bids.

No bids may be withdrawn for thirty (30) days after the scheduled closing time for receipt of bids.

PENNSYLVANIA TURNPIKE COMMISSION
James F. Torrance
Secretary and Treasurer

Harrisburg, Pennsylvania
10 January 1955

Bids: February 1, 1955

New Jersey Turnpike Authority

CONTRACT NO. N-26B

Proposals are invited for Contract No. N-26B which involves the construction of the substructure, consisting of twenty-three (23) piers, for a portion of the North Terminal Ramps—Section B, in Jersey City, Hudson County, New Jersey, all in connection with the construction of the Newark Bay-Hudson County Extension of the New Jersey Turnpike.

The principal items of work include:

Open Foundation Excavation	3,800 Cu. Yds.
Treated Timber Piles	17,000 Lin. Ft.
Cast-In-Place Piles	31,000 Lin. Ft.
Concrete	6,125 Cu. Yds.
Reinforcement Steel	330,000 Lbs.

Proposals will be received at the New Jersey Turnpike Authority Administration Building, New Brunswick, New Jersey, until 11:00 O'Clock Eastern Standard Time on the morning of February 1, 1955, at which time and place said proposals will be publicly opened and read.

Each bidder must submit with his proposal a Contractor's Financial and Equipment Statement.

Contract documents may be examined during office hours after January 11, 1955, at the office of the Authority and at the office of the Consulting Engineer, Howard, Needles, Tammen & Bergendoff, 55 Liberty Street, New York 5, New York. Contract documents will be furnished upon payment of Fifteen Dollars ($15.00) for each set, upon application to the Authority. Contract documents are not required to be returned and the payment will not be refunded.

NEW JERSEY TURNPIKE AUTHORITY
January 7, 1955 Paul L. Troast, Chairman

Bids: January 27, 1955

New York State Thruway Authority

TYPE "B" GAS STATION AND RESTAURANT AT WESTMORELAND, N. Y.

Separate sealed proposals covering Construction; Heating, Ventilating and Air Conditioning; Plumbing; Electric; Elevator and Commercial Refrigeration Work, for New York State Thruway Authority, Type "B" Gas Station and Restaurant, Westmoreland, N. Y.; in accordance with Specification Nos. 19221, 19222, 19223, 19224, 19225 and 19226 and accompanying drawings will be received by Henry A. Cohen, Director, Bureau of Contracts and Accounts, Department of Public Works, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y., on behalf of the New York State Thruway Authority, until 2:00 o'clock P. M., Eastern Standard Time, on Thursday, January 27, 1955 when they will be publicly opened and read.

Each proposal must be made upon the form and submitted in the envelope provided therefor, and shall be accompanied by a certified check made payable to the Comptroller of the State of New York as agent for the New York State Thruway Authority, of 5% of the amount of the bid as a guaranty that the bidder will enter into the contract if it be awarded to him. The specification number must be written on the front of the envelope. The blank spaces in the proposal must be filled in, and no change shall be made in the phraseology of the proposal. Proposals that carry any omissions, erasures, alterations or additions may be rejected as informal. The Authority reserves the right to reject any or all bids. Successful bidders will be required to give a bond conditioned for the faithful performance of the contract and a separate bond for the payment of laborers and material men, each bond in the sum of 100% of the amount of the Contract. Drawings and specifications may be examined free of charge at the following offices:

State Architect, 270 Broadway, New York City
State Architect, The Gov. A. E. Smith State Office Building, Albany, N. Y.
District Engineer, 109 N. Genesee Street, Utica, New York
District Engineer, 301 E. Water Street, Syracuse, New York
District Engineer, Barge Canal Terminal, Rochester, New York
District Engineer, 65 Court Street, Buffalo, New York
District Engineer, 30 West Main Street, Hornell, New York
District Engineer, 444 Van Duzee Street, Watertown, New York
District Engineer, Pleasant Valley Road, Poughkeepsie, New York
District Engineer, 71 Frederick Street, Binghamton, New York
District Engineer, Babylon, Long Island, New York

Drawings and Specifications may be obtained by calling the Bureau of Contracts and Accounts, Department of Public Works, 14th Floor, The Governor A. E. Smith State Office Building, Albany, New York, or at the State Architect's Office, 18th Floor, 270 Broadway, New York City, and by making deposit for each set as follows: Construction, $30.00; Heating, Ventilating and Air Conditioning, $20.00; Plumbing, $20.00; Electric, $20.00; Elevators, $5.00; Commercial Refrigeration, $5.00; or by mailing such deposit to the Albany address. Checks shall be made payable to the New York State Department of Public Works. Proposal Blanks and envelopes will be furnished without charge.

Dated: 12/22/54

Bids: February 8, 1955

New Jersey Turnpike Authority

CONTRACT NO. N-27B

Proposals are invited for Contract No. N-27B which involves the fabrication and erection of the superstructure steelwork for Section B of the North Terminal Ramps, comprising the Southbound Ramp from Pier SB25 at Tenth Street to its east abutment at Fourteenth Street between Coles Street and Jersey Avenue, and the Northbound Ramp from Pier NB24 at Tenth Street to its east abutment at Twelfth Street between Coles Street and Jersey Avenue, and other incidental work, in Jersey City, Hudson County, New Jersey, all in connection with the construction of the Newark Bay-Hudson County Extension of the New Jersey Turnpike.

The principal items of work include:

Structural Low-Alloy Steel	635,000 Lbs.
Structural Carbon Steel	8,770,000 Lbs.
Furnishing Metal Railing	7,710 Lin. Ft.

Proposals will be received at the New Jersey Turnpike Authority Administration Building, New Brunswick, New Jersey, until 11:00 O'Clock Eastern Standard Time on the morning of February 8, 1955 at which time and place said proposals will be publicly opened and read.

Each bidder must submit with his proposal a Contractor's Financial and Equipment Statement.

Contract documents may be examined during office hours after January 14, 1955, at the office of the Authority and at the office of the Consulting Engineers, Howard, Needles, Tammen & Bergendoff, 55 Liberty Street, New York 5, New York. Contract documents will be furnished upon payment of Fifteen Dollars ($15.00) for each set, upon application to the Authority. Contract documents are not required to be returned, and the payment will not be refunded.

NEW JERSEY TURNPIKE AUTHORITY
Paul L. Troast, Chairman

January 11, 1955

U. S. Government

GOV. OF DIST. OF COL., DEPT. OF HIGHWAYS. Jan. 6, 1955. SEALED PROPOSALS will be recd. in Rm. 404, 499 Pa. Ave., N.W., Wash. 1, D. C., until 2PM, EST, Feb. 4, 1955, and then publicly opened and read for Painting South Capitol Street Bridge over the Anacostia River. Proposal forms, specns. and plans obtainable from Supervisor, Contr. & Bond Section, without charge, Procurement Office, D. C., Rm. 406, 499 Pa. Ave., N.W. (Tel. NA 8-6000, Ext. 2378).

OFFICIAL PROPOSALS

(Continued from opposite page)

Bids: February 1, 1955

Construction of Passenger Station

Construction of a two story passenger station, steel canopy and shelter building, located in the Borough of Dunellen, County of Middlesex, New Jersey, in connection with the Dunellen-Plainfield Grade Crossing Elimination Project, under Order of the Board of Public Utility Commissioners, State of New Jersey

Sealed proposals for the construction of a two story masonry, steel and reinforced concrete passenger station (22'x57'), steel canopy (18'x146'), and shelter building (15'x 42'), adjacent to track elevation work now in progress, will be received by The Central Railroad Company of New Jersey, at the office of the Chief Engineer of the Railroad, located at Jersey City Terminal, Room 44, Foot of Johnston Avenue, Jersey City, N. J., until 1:00 PM EST, Tuesday, February 1, 1955, and then be publicly opened and read.

Proposal forms, drawings, specifications, bond and insurance requirements may be obtained at the office of the Chief Engineer of The Central Railroad Company of New Jersey, at the above address, on or after Friday, January 14, 1955. Drawings and specifications may be obtained upon application at the office of the Chief Engineer on a deposit of Twenty-five Dollars ($25.00) per set. A refund in full will be made to bidders upon return of each set in good condition within 30 days of award or rejection of bids.

This work will be awarded as a general contract and the successful bidder will be required to perform with his own organization not less than 80% of the total value of the contract, except for materials or items of work which require specialized knowledge, craftsmanship, or equipment not ordinarily available in a contractor's organization.

Bids must be made upon the standard proposal forms furnished for this purpose by the Railroad Company and must be enclosed in sealed addressed envelopes bearing, on the outside, the name and address of the bidder and the identity of the contract work covered by the bid, and must be accompanied by a certified check drawn to the order of the Treasurer of The Central Railroad Company of New Jersey, in the amount of Ten Thousand Dollars ($10,000.). Bids and checks not enclosed in sealed addressed envelopes will be considered informal and will not be accepted.

The Railroad Company reserves the right to reject any or all proposals.

S. L. Mapes, Chief Engineer
The Central Railroad Company of New Jersey
Jersey City Terminal, Jersey City 2, New Jersey

U. S. Government

Sealed bids in triplicate for remodeling Congress Street U. S. Post Office, Chicago, Illinois, will be received until 2:00 P.M., CST on Feb. 8, 1955 in Rm. 575 U. S. Court House, 219 South Clark Street, Chicago, Illinois, and then publicly opened in Rm. 575. Two sets of bidding material may be obtained without charge by general contractors desiring to bid the entire project from Public Buildings Service, Rm. 1304 General Services Bldg., Washington 25, D. C., or General Services Administration, Deputy Regional Director, P.B.S. Rm. 575 U. S. Court House, 219 South Clark St., Chicago, Illinois. Additional sets may be secured by depositing $40.00 per set. Checks offered as a deposit must be made payable to the order of the Treasurer, U. S., P. A. Strobel, Commissioner of Public Buildings, General Services Administration.

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-4307), will be received at Cody, Wyoming, until February 17, 1955, for furnishing labor and materials for: Hanover Pumping Plants No. 1, No. 2, No. 3, and No. 4 and canals and laterals; and Bluff Pumping Plants No. 1 and No. 2 and laterals; Big Horn Basin Division, Hanover Bluff Unit, Wyoming, Missouri River Basin Project. Location near Worland, Wyoming. Principal items are: 76,700 cu. yds. excavation; 580 cu. yds. concrete; 7,990 lin. ft. furnishing and laying concrete pipe; 48,400 pounds furnishing and installing pump manifolds and trashracks; 50,000 pounds installing motor-driven, horizontal pumping units; lump sum furnishing and installing motor-driven, vertical-shaft, turbine-type pumping units; and other work. Completion time 560 days. For particulars, address Bureau of Reclamation, Cody, Wyoming; or Building 53, Denver Federal Center, Denver, Colorado. W. A. Dexheimer, Commissioner.

EMPLOYMENT

AND OTHER BUSINESS OPPORTUNITIES

REPLIES (Box No.): Address to office nearest you
NEW YORK: 330 W. 42nd St. (36)
CHICAGO: 520 N. Michigan Ave. (11)
SAN FRANCISCO: 68 Post St. (4)

POSITIONS VACANT

WANTED: TWO structural steel detailers and designers with experience. Positions permanent. P-4962, Engineering News-Record.

BRIDGE—HIGHWAY Engineers—Designers—Draftsmen. For work on bridges, expressways and turnpikes. Location Midwest. Permanent positions with periodic promotions depending on experience and ability. Paid vacations, sick leave, hospitalization and life insurance. Include education, experience, reference and salary expected in application letter. P-4968, Engineering News-Record.

EXPERIENCED ASPHALT Plant operator capable of assuming full charge modern asphalt plant in Northern New Jersey. Send full information as to background and income requirements in first letter to P-5015, Engineering News-Record.

DRAFTSMEN—STRUCTURAL Detailers—permanent positions with medium size structural shop in large city on eastern seaboard. Write fully, stating age, experience, availability, and salary requirements. P-5055, Engineering News-Record.

EXPERIENCED OFFICE Engineer-estimator to work for general contractor. New York-New Jersey area. P-5054, Engineering News-Record.

NEW YORK-New Jersey firm seeks experienced outside construction man as general superintendent-project manager. P-5053, Engineering News-Record.

PROJECT SUPERINTENDENTS — To completely handle in field complete mechanical contract portions of large industrial and institutional building projects. Middle Atlantic States. Give complete details, including projects handled and dollar value, age, references and salary expected. P-5059, Engineering News-Record.

DESIGN ENGINEERS—Men having experience in design and preparation of drawings and reports for Sanitary Sewer, water distribution and municipal-type storm drainage systems. Good pay for qualified men with training and experience. Opportunity for advancement. Furnish full information regarding education, training and experience, age, references and salary required. Replies strictly confidential. P-5082, Engineering New-Record.

GRADUATE ARCHITECT or Engineer interested in the business side of architecture to process and coordinate details in connection with regional shopping centers. Salary open. John Graham and Company, Architects and Engineers, 1426 Fifth Avenue, Seattle 1, Washington.

BRICKLAYER FOREMAN—Must be capable of laying out work and securing production and accept responsibility. Free to travel. Apply James McHugh Construction Co., 6449 South Park Avenue, Chicago 37, Illinois. Butterfield 8-4100 (Extension 17, for appointment for interview).

SUPERINTENDENT: TOP-flight highway and bridge superintendent wanted by contractor with headquarters in New England. Must be able to produce and have a following of key men. Must be available within 30 days. Liberal compensation for qualified man. P-5085, Engineering News-Record.

STRUCTURAL STEEL Draftsman & Est. must have minimum of 5-10 yrs. experience in structural steel designing and estimating. Starting salary $5-7,000. Good future with structural steel fabricator in Ohio. P-5091, Engineering News-Record.

(Continued on following page)

CONSTRUCTION SUPERINTENDENT—Expanding company has excellent permanent position open for capable, dependable man experienced in building bridges, pile driving, foundations, earth work, and building construction. Estimating experience required. Illinois—Iowa Operations. Give full details, age, education, experience, references, and salary expected, in first letter.

P-5172, Engineering News-Record
520 N. Michigan Ave., Chicago 11, Ill.

WANTED

Man to act as

BRANCH MANAGER

In new building for Caterpillar Distributor in Northeastern United States. Must have experience in sales, sales control, parts and service management. Please write and give full qualifications.

P-5041, Engineering News-Record
330 W. 42 St., New York 36, N. Y.

Refinery Construction Superintendent.

Must have minimum 5 years experience in full charge major installations.

Must have full knowledge of Piping, Rigging, Instrumentation, Boilermaker Work, Millwrighting, Welding.

Prefer College Graduate.

State experience record and salary expected.

California location.

P 5103 Engineering News-Record
1111 Wilshire Blvd. Los Angeles 17, Calif.

DESIGN ENGINEER

Graduate mechanical engineer with at least five years' experience in Sheet Metal Building fabrication. Well established company located in major Midwestern city. Salary open. Age 32-44. Write full particulars to

P-5175, Engineering News-Record
520 N. Michigan Ave., Chicago 11, Ill.

DESIGN ENGINEERS

Excellent opportunity for Engineers experienced in design of Filter Plants and Water Works—Bridges and Highway. Recent Graduates also accepted. Good living conditions and Bonus and Pension Plan. Include experience, date available, salary desired in first letter. Gannett Fleming Corddry & Carpenter, Inc., Box 366, Harrisburg, Pa.

BRIDGE ENGINEERS

Designers—5 years experience in both steel and concrete.
Recent Graduates — Structural majors, preferably with Master degrees.
Highway Engineer—Familiar with interchange layouts.

FRANK D. McENTEER
504 Baltimore Avenue, Clarksburg, W. Va.

DRAFTSMEN

Experienced structural steel detailers and checkers for building work and conveyor detailing. Consulting office with good working conditions, vacation plan, payed holidays, and hospitalization program. Please send complete written information in first letter.

SAMBORN, STEKETEE & ASSOCIATES
1214 Cherry Street Toledo 4, Ohio

CLASSIFIED SEARCHLIGHT SECTION ADVERTISING

EMPLOYMENT • BUSINESS • OPPORTUNITIES • EQUIPMENT—USED or RESALE

UNDISPLAYED RATE:
(Not available for equipment advertising)

$1.80 cents a line, minimum 3 lines. To figure advance payment count 5 average words as a line.

POSITION WANTED undisplayed advertising rate is one-half of above rate, payable in advance.

PROPOSALS, $1.80 a line an insertion.

INFORMATION:

BOX NUMBERS count as 1 line additional in undisplayed ads.

DISCOUNT OF 10% if full payment is made in advance for four consecutive insertions of undisplayed ads (not including proposals).

EQUIPMENT WANTED or FOR SALE Advertisements acceptable only in Displayed Style.

DISPLAYED—RATE PER INCH:

The advertising rate is $20.50 per inch for all advertising appearing on other than a contract basis. Contract rates quoted on request.

AN ADVERTISING INCH is measured ⅞ inch vertically on one column, 3 columns—30 inches—to a page. E.N.R.

Send NEW ADVERTISEMENTS: To New York Office, 330 W. 42nd St., N. Y. 36 for February 3rd issue closing January 24

WANTED—EARTHMOVING SALES REPRESENTATIVES

Responsible positions open for qualified experienced sales representatives in connection with expanding sales program. Headquarters in Midwest and Mid-Southwest. Knowledge and experience with heavy earthmoving equipment essential. Civil engineer graduate preferred. Send complete qualifications and recent photograph to:

Mr. R. W. Christofferson, *Sales Dept.*
WOOLDRIDGE MANUFACTURING CO.
Sunnyvale, California

AGENTS WANTED

Steel Joist Manufacturer, member S. J. Institute has attractive proposition for local representatives capable estimating and selling steel joists. Write

RW-5136, Engineering News-Record
330 W. 42 St., New York 36, N. Y.

POSITIONS VACANT
(Continued from preceding page)

GRADE FOREMAN familiar with all types of heavy excavation and grading. Good opportunity. Work in central N. Y. State. Experience references. P-5096, Engineering News-Record.

CARPENTER FOREMAN, familiar with all types of bridge work. Good opportunity with good concern. P-5098, Engineering News-Record.

WANTED—CIVIL Engineering graduate for half-time work in prestressed concrete research at university in eastern Pennsylvania. Opportunity for MS or PhD degree. Salary $120. per month with tuition paid. Address reply to P-5021, Engineering News-Record.

JUNIOR CIVIL Engineer wanted by the City of Highland Park, Michigan. Salary $4472.00 to $4825.00. Retirement, sick leave and vacation benefits. Apply room 4, 30 Gerald, Highland Park 3, Michigan.

SALES ENGINEERS—Experienced in estimating reinforcing bars and steel joists—should have some sales experience. Good openings with nationally known company. Write giving full details of experience, education, desired salary. P-5132, Engineering News-Record.

SALESMEN WANTED—Crane, shovel, and front end loader experience desirable. North Jersey territory. Salary open. Reply P-5158, Engineering News-Record.

DRAFTSMEN, STRUCTURAL. Midwestern structural fabricating plant has permanent openings for young draftsmen with at least three years experience in detailing structural and miscellaneous for all types of buildings and highway bridges. All employee benefits, insurance, paid vacations, etc. Reply by letter stating experience and salary requirements to P-5171, Engineering News-Record.

CONSIDERING TOP Administrative and Supervisory personnel in categories of Project manager, job superintendent, general superintendent, coordinator and chief engineer preferably with experience on foreign projects in Spanish speaking countries. Send resume to P-5123, Engineering News-Record.

CONSTRUCTION ENGINEER. Growing Alabama contractor wants proven earner to estimate, bid and personally supervise medium size construction. Nominal salary and share in earnings. Only men with highest qualifications considered. Include education, experience, references and earnings expected in first letter. P-5204, Engineering News-Record.

CONSTRUCTION SALES ENGINEERS

One of our clients, who is expanding operations, has openings for several sales engineers to procure negotiated construction contracts throughout the eastern and central United States. Applicants should be free to travel. Excellent earnings possible, commensurate with proven background and ability.

Our client is interested in and capable of performing quality work in building new industrial plants and buildings, large apartment houses, as well as piers and bridges, and participates in their financing.

If you have a successful background in similar work or intangible sales and would be interested in joining an organization which has shown steady growth for the last 20 years, please submit a detailed resume of your past work history, including a recent small photo of yourself. All replies held strictly confidential.

Write to—
METHODS ENGINEERING COUNCIL (Management Consultants)
718 Wallace Ave., Pittsburgh 21, Pa.

POSITIONS VACANT

WANTED: MECHANIC, familiar with all types of heavy road equipment. Some ability to operate same. Work in central New York. P-5093, Engineering News-Record.

EMPLOYMENT SERVICE

SALARIED PERSONNEL, $3,000-$25,000. This confidential service, established 1929, is geared to needs of high grade men who seek a change of connection under conditions assuring, if employed, full protection to present position. Send name and address only for details. Personal consultation invited. Jira Thayer Jennings, Dept. L, 241 Orange St., New Haven, Conn.

POSITIONS WANTED

AVAILABLE REGISTERED Illinois professional civil engineer and land surveyor. Excellent supervisory experience in heavy industry and construction. Will travel. Age 41. PW-4981, Engineering News-Record.

ENGINEER EXECUTIVE age 40. B.S.C.E., registered several states, married, top administrative and management background industrial and chemical projects. Know customer-labor relations, contract negotiation-sales. Positions field eng'r., supt., project manager and staff level assignment U. S. and abroad. Well connected. PW-5012, Engineering News-Record.

CONSTRUCTION EXECUTIVE, available as project manager, on large operation, chief estimator for large organization or in other executive position where scope warrants employment of top man, thoroughly experienced on all types of construction and in every phase of general contracting. PW-5074, Engineering News-Record.

CIVIL ENGINEER age 37. Long experience in heavy construction. Also municipal, highway and office. PW-5000, Engineering News-Record.

CONSTRUCTION STIFF, Rigger, who has worked with lubricating oil for years as a hobby, seeks employment in a modest capacity, with a construction company, or other fleet owner using large quantities of oil, where his information and paraphernalia will be investigated, and where he will be encouraged to go ahead with some things he wants to do. Local or foreign. Sidney Stribling, Sta. 8, Asan, Agana, Guam, M. I.

CIVIL ENGINEER, 15 years municipal engineering and construction, zoning, inspections, etc. Age 38, Reg. P.E., BSME, 3 years CE courses, holding responsible administrative position several years. Desires consulting, construction, municipal fields, with future. PW-5073, Engineering News-Record.

CONSTRUCTION ENGINEER, N. J. license; 27 yrs. varied experience; steam generated power plants, industrial buildings, heavy foundations and water front facilities. Supervise various trades and sub-contractors, estimate, prepare reports, etc. Available immediately. PW-5113, Engineering News-Record.

POSITIONS WANTED

CONSTRUCTION ENGINEER — C. E. Grad. Reg. Prof. Engr. 21 years experience 11 of which as supt. of const. Also experienced estimator. Know job pushing, equipment, cost control. Experience about ⅓ building ⅔ heavy—big jobs and small. Available March 15. PW-5124, Engineering News-Record.

CIVIL ENGINEER: Three years heavy experience in all phases of highway work, for prominent consultants. Needs responsible job with a future. Family man, but will relocate in N.E. PW-5191, Engineering News-Record.

ASSISTANT SUPERINTENDENT, CE, 25, five years bridge highway and building experience. PW-5192, Engineering News-Record.

HIGHWAY DESIGNER experienced in charge of design primary, toll, and municipal projects. Prefer South or Southwest. PW-5180, Engineering News-Record.

ESTIMATOR—BUILDINGS. Graduate CE. Six years office and field experience. Best references. PW-5184, Engineering News-Record.

ENGINEER, CE, PE. Estimate, price, detail design, field supervision. Layout all phases reinforced concrete work. 10 yrs. exp. PW-5186, Engineering News-Record.

PROMOTION—SALES: 16 years of general civil engineering: field, office, specifications: concrete, and bituminous concrete design. Desirous of change to So. Calif. Will submit resume. PW-5147, Engineering News-Record.

(Continued on opposite page)

LEARN ESTIMATING

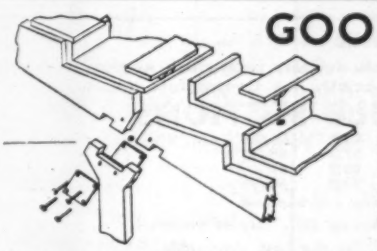
Complete Building Estimators Course, also Building Labor Calculator for practicing estimators. Thirty-fourth year serving the building industry. For free trial and all particulars write:

TAMBLYN SYSTEM
1420 Gilpin St. Denver 6, Colorado

STRUCTURAL ENGINEERING
ARCHITECTURAL ENGINEERING
OUR COURSES of instruction by mail HAVE HELPED THOUSANDS to better positions and to pass State Board Examinations. Forty-third year
WILSON Engineering Corp.
College House Offices HARVARD SQ., CAMBRIDGE MASS

Engineers—Foremen—Office Men

Learn latest methods to organize and run work. Prepare for the top jobs.
Send post card for details.
GEO. E. DEATHERAGE & SON
CONSTRUCTION CONSULTANTS
411 So. 5th Ave. Lake Worth, Florida



GOOD BUSINESS FOR "CONTRACTORS"

PROFITABLE SALES OPPORTUNITY

Highly profitable franchises available for Sales and Construction of patented, pre-cast concrete Grandstands on a royalty basis. Tremendous sales potential already proven. For use by schools, colleges, county fairs, race tracks, rodeos, etc.

This operation necessitates companies or individuals capable of handling large volume contracts and having experience in sales promotion work. Send for brochure.

• Over 40 "CASTADIA" have been built in the Mid-West

Contact———— **CASTADIA, INC.**
2242 North 36th Street Milwaukee 8, Wisconsin
Phone—Hilltop 2-5020

POSITIONS WANTED
(Continued from opposite page)

CONTRACTOR'S CHIEF Engineer estimator—age 52—extensive top flight experience in building and heavy construction fields. Assume full responsibility prepare building estimates, any type, any size job. Handle fully usual general contractor routine. Much experience bidding public work. Would consider any location including California. PW-5134, Engineering News-Record.

CIVIL ENGINEER—M.S. Age 47. Long experience in all types of structures—most years in design. Good leader for large engineering section—abilities of greatest value to oil, utilities, railroad, steel or chemical co. Qualifications strong and attractive to consulting engineers—interview can be arranged. PW-5145, Engineering News-Record.

CONSTRUCTION ENGINEER, B.S.C.E., 33, 5 years experience industrial steel, concrete and machinery on projects of magnitude. Cost and detail conscious. Responsibility essential. PW-5141, Engineering News-Record.

LAYOUT ENGINEER—Designer, 51, experienced plant engineering, industrial piping, processing & material handling equipment, mechanical installations & structures. Will relocate. PW-5168, Engineering News-Record.

BRIDGE ENGINEER—M.S.—15 years exceptional design experience in large fixed and movable bridges—8 years in allied engineering fields—would consider University town. PW-5146, Engineering News-Record.

CIVIL ENGINEER, BSCE, 30 registered, 6 years experience in responsibile municipal and municipal consulting positions on pavement, sewerage and water. Desires relocation in northern midwest with municipality or consultant. PW-5166, Engineering News-Record.

CIVIL ENGINEER, 28, B.S.C.E. Reg, 6 years experience heavy construction — dams and bridges as office and project engineer desires opportunity as estimator. PW-5163, Engineering News-Record.

CONSTRUCTION ENGINEER — Graduate and registered. 15 yrs responsible experience hydro-power, steam plant and general industrial construction. PW-5164, Engineering News-Record.

CONSTRUCTION MANAGER B.S.C.E. fourteen years experience in planning, organization, execution and management of atomic energy, chemical and oil refinery construction, desires permanent position with progressive firm. PW-5160, Engineering News-Record.

SOILS AND Foundation engineer—M.S. from M.I.T. 6 years office and field experience in highway, airport and earth dam design. Alert, energetic worker. Desires responsible position with opportunity for advancement. PW-5157, Engineering News-Record.

CONSTRUCTION EXECUTIVE. Graduate engineer desires administrative, executive or sales position in construction field, or where an executive engineer is needed. Have 30 years experience self-employed in building construction, including work of every description such as schools, hospitals, public housing, military work, commercial and private work. Southern United States, Far West or foreign locations. PW-5142, Engineering News-Record.

CONSTRUCTION MANAGER well versed in contract procedure, excellent background government contracts, joint ventures, cost-plus work. Experienced in purchasing, expediting, handling subs, and payment est. of all types. Complete knowledge of all correspond., drawings, equip. & methods. Age 31, Chicago area preferred. PW-5128, Engineering News-Record.

CONSTRUCTION ENGINEER, estimator, 12 yrs diversified field & office experience (6 in resp. charge), airfields & facilities, harbor installations, industrial developments, highways, housing. Want responsible engrg. or supv. position, foreign or domestic. PW-5114, Engineering News-Record.

GEN. SUP'T. Bridge construction thoroughly familiar, all types bridge construction. Sober, willing to relocate. Presently completing 7-structure job. Available immediately. PW-5075, Engineering News-Record.

POSITIONS WANTED

CIVIL ENGR., M.S.C.E., Regis. Calif., 6½ years experience in hydraulics, irrigation, surveying and small construction. Would consider position with small firm. Western states or foreign. PW-5115, Engineering News-Record.

CANADIAN CIVIL Engineer five years experience design and construction of roads, utilities and houses desires position with opportunity in South or Southwestern states. PW-5202, Engineering News-Record.

CIVIL ENGINEER, 27, MS Hydraulics, M.I.T. Tau Beta Pi. Experience in teaching, research, construction surveys and inspection, and hydrology. PW-5203, Engineering News-Record.

SELLING OPPORTUNITY WANTED

MANUFACTURERS REPRESENTATIVE traveling Pac. N. W. construction and logging needs additional related line with $5000 potential. RA-5190, Engineering News-Record.

SPECIAL SERVICES

Appeals Service: Construction Contractors, who intend to appeal decisions of the contracting officer concerning disputed questions of fact under government contracts, are offered complete representative service covering analysis, preparation and processing of appeals. SS-5062, Engineering News-Record.

Aggressive Engineering Organization in Caribbean area would like to handle surveys, reports, inspections, etc for U. S. Engineering, architectural, and manufacturing concerns active in this area. SS-5201, Engineering News-Record.

BUSINESS OPPORTUNITY

We are seeking young experienced engineer or superintendent who can invest and become part owner of established Penna. highway contracting firm. BO-5181, Engineering News-Record.

CAPITAL WANTED

We have a deposit of Pure Limestone in Penna. that can be used in the manufacture Portland Cement; as a fluxing stone for making steel; as an aggregate for Highways and Airports. We need capital for Plant and operation.

BO-5193, Engineering News-Record
330 W. 42 St., New York 36, N. Y.

It's Here... Contractors, Estimators
New Book
ESTIMATING PRODUCTION AND CONSTRUCTION COSTS
Never Goes Out of Date
Estimate general construction costs. More Accurate. Write for 10 day free exam. $15 postpaid from:
THE DALLAVIA CO.
Dept. E 2110 Elmen, Houston, Texas

FOR SALE
3 Drum 10x12 Steam Hoist
Twin Disc Torque Convertors
Twin Screw Sea Mule Tug
Stiffleg Derrick—LCT Pulling Hoists
Scows, Barges, Shackles, Slings, etc.
WALTER MERWIN & SON
186 Woodbridge Ave. Sewaren, N. J.
WOodbridge 8-3059

EMERGENCY POWER PLANTS
Field — Home — Factory
2½—50 KW Single or three phase, gas & diesel sets. Immediate delivery.
Government Surplus.
RALPH R. BRUMEL, Power Equipment
Box 59 Ryder Station Brooklyn 34, N. Y.
CLoverdale 3-6646

UNUSED KLAUER SNOW-GO
mounted on 4x4 Ford truck chassis with Marion Herrington all wheel drive transmission. Bargain price.
Builders Equipment & Supplies Co.
40 Canal St. West Medford, Mass.
My. 6-8700

FOR SALE
S-10 McKiernan-Terry Pilehammer. Practically New. Energy Blow—32,500#. Shipping Weight—23,793#. Equipped with H Beam Anvil 12"—14". Used 1 month. Cost—$11,175.00. Pants for same—$425.00. Net cost—$11,600.00. Sale Price f.o.b. Nanticoke, Pa.—$10,000.00.
WAGMAN PILE COMPANY, INC.
370 East Main Street Dallastown, Pa.
Phone: Red Lion 33851

WANTED

WANTED TO BUY
HEAVY DUTY ARMY PINTLE HOOKS
Preferably New Army Surplus
40 TON LOW-BED SEMI-TRAILER
The Following Truck Equipment Must Be 1951 or Better
C90—U90 AUTOCARS
With 120" C/A, 11x24 Tires.
EUCLID DUMPERS
10 and/or 18 yd.
AUTOCAR DIESEL TRACTORS
DC100TR-N with 11x24 Tires, Dual Transmissions.
10 WHEEL 10 YARD DUMPERS
Diesel Autocar DC10064S, Mack LJSW Semi-Rock Bodies, 11x24 Tires, Five Speed Main, O.D. Fifth. DUMPERS, 32,000 G.V.W. 7-8 yd.
State Location, Availability, Mechanical and Tire Condition, Appearance, Net Price.
FRANK BENSON TALLMAN
1158 Fifth Ave. New York 29, N. Y.

WANTED TO BUY
4000' 15 or 16" CONCRETE FORMS
WILLIAMS CONSTRUCTION CO.
Box 145 Baltimore 20, Md.

WANTED
2—600 CFM Gyro-Flo Type Diesel Air Compressors.
Diamond Construction Co.
P. O. Box 1074 Savannah, Georgia
Phone 6-2451

WANTED TO BUY
Two Used 50 Ton Pneumatic Tired Compactors
PERRINI QUEBEC INC.
1510 Drummond St. Montreal, Quebec
Tel. No. Belair 2-361

WANTED
1500 cubic yard steel bin for crushing plant.
JOHN ARBORIO, INC.
West Cedar Street, Poughkeepsie, New York

COMPRESSOR: Ingersoll Rand PRE-2, Cap. 1000 CFM @ 100 lbs., 2200 volt, complete. Chicago Pneumatic OCB, 1044 CFM, 200 H.P., 440 volt, 3 phase, 60 cycle.

TRANSITE PIPE: 7000 ft. 10" and 14", Class 100, 150 and 200. (NEW).

OVERHEAD ELECTRIC CRANES: Whiting 8 ton, 54' span, 4 motor, clam shell bucket operating, 440 volt, 3 phase, 60 cycle. Several other cranes both AC and DC, various spans, 5 tons to 55 tons, 3 and 4 motor.

LOCOMOTIVE CRANE: 25 ton capacity, standard gauge, gasoline powered, cast steel trucks, air brakes, with or without 1-¼ yd. Williams clam shell bucket, thoroughly modern, excellent condition. Located Minnesota. For sale or rent.

LOCOMOTIVES: 2—65 ton diesel electric, standard gauge, thoroughly modern, excellent condition. For sale or rent.

MINE HOISTS: Single and double drum, 100 to 1500 H.P. with all electrical equipment. Complete specifications, drawings and photos available.

HOIST MOTORS:
300 H.P., 435 RPM. 600 H.P., 710 RPM.
400 H.P., 588 RPM. 1200 H.P., 444 RPM.
2200 volt, A.C., with controls

SINK FLOAT PLANT: Mobil two-unit with two 7 ft. dia. HMS Separating Cones with screens, pumps, magnetic separators, densifiers, demagnetizing coils, pump, piping, valves, framework, etc. with all control equipment.

ROLL CRUSHERS: Single roll, 30" x 54" and 36" x 60", heavy duty.

JAW CRUSHER SPECIALS: Allis Chalmers 42" x 40", 48" x 36" and 36" x 24"; with motors and drive. Rebuilt.

WE BUY AND SELL EQUIPMENT THROUGHOUT NORTH AND CENTRAL AMERICA

A. J. O'NEILL
Lansdowne, Pa.
Phila. Phones: MAdison 3-8300—3-8301

FOR SALE
New and Used material—Immediate delivery from stock Angles, Channels, I and WF Beams, especially for Contractors needs

H BEAMS PILE SECTIONS

50 pcs	10" B P S	42#	48/60'
46 "	10" B P S	57#	40/67'6"
60 "	12" B P S	53#	60'
63 "	14" B P S	73#	60/75'

Phone or Wire your steel requirements

We are also interested in purchasing your surplus material.
We assure you our prices will be the best obtainable.

HY DRACHMAN STEEL CORP.

Warehouse
1423 34th Avenue, Astoria, New York
AStoria 8-4484 8-8023

Sales Office
563 East Tremont Ave., New York City, N. Y.
CYpress 9-5440

FOR RENT OR SALE
MANITOWOC CRANES
Models 2000-B or 3500—25 T. to 60 Ton Capacity—50' to 125' booms—20' or 30' jibs—manual controls — independent booms —torque converters.

McCARRICK BROTHERS
1700 E. Ridge Pike P.O. Box 291
Norristown, Pa. Phone: 8-4231

FOR SALE
BARGAIN
1½ Cubic Yard Blaw-Knox R46, Bottom Dump Concrete Buckets.
$175.00 each
Subject to prior sale

FRAZIER-DAVIS CONSTRUCTION CO.
1319 Macklind Ave., St. Louis, Mo. ST. 1-1950
Box 188, Grahamsville, New York..... 2861

FOR SALE
SIX—10 Wheel Mack Dumps
1950 Model L F S W. 10 x 22 Tires
510 cu. in. Mack Gas Engine
8 Yard Bodies—2 Yard Strips
Excellent Condition—Priced Right

FRANK BENSON TALLMAN
1158 Fifth Ave. New York 29, N. Y.

PARSONS TRENCHLINER
Model 250 1946-'47
36" sidecutters
Excellent condition—bargain price

PESCO EQUIPMENT CO.
226 Mystic Ave. *Mystic 6-8710* Medford, Mass.

CRANES FOR RENT

CRAWLERS Capacities to 60 tons Booms to 180 ft.
TRUCK CRANES Capacities to 35 tons Booms to 130 ft.

P and H. Lima and Manitowoc.
Top-Condition erection cranes

ROGER SHERMAN
CRANE SERVICE, INC.
East Hartford, Connecticut JAckson 8-4106

1—150 ton Rogers Hydraulic Jacking Unit Model J150-48-D3 w/2 double acting cylinders, 48" Ram Travel powered w/Wisconsin Air Cooled Gas Engine mounted on two wheel pneumatic tired trailer. Used very little. Purchased 1953 price $2,300.00

1—Hough Payloader Model HM powered w/Hercules JXD Gas Engine Serial #90008. Year 1949. Completely rebuilt. Price....$8,000.00.

CAMPANELLO & CARDI CONST. CO.
780 Jefferson Blvd. Hillsgrove, R. I.

RAILS-TIES
TRACK ACCESSORIES
NEW and RELAYING

NEW—RAILS—Relayers
All sizes and weights. Also frogs, switches, spikes, bolts, tie plates, contractors' and mine equipment carried in stock.

M. K. FRANK
480 Lexington Ave. Park Bldg.
New York, N. Y. Pittsburgh, Pa.
Reno, Nevada Carnegie, Pa.

LOCK COIL CABLE

2—Pieces 3½" x 1600 foot Lock Coil Cable with Sockets. Price on application.

Guy F. Atkinson Company
10 West Orange Avenue
So. San Francisco, Calif.

PUMPCRETE
LIKE NEW
IN PERFECT CONDITION

Rex 200 Double powered by Waukesha 6 cyl. engine, overhead platform & controls, pug-mill remixer, selected drive transmission, auxiliary equipment and over 600'—8" pipe.

READY FOR IMMEDIATE WORK

G. A. COONEY
2128 Hudson Chicago 14, Ill.
Financial 6-0456

RAILROAD Cross and Switch **TIES**
Promptly from adequate stocks
NEW and USED *(as available)*

GILLIS & COMPANY
29 East Madison St. Chicago 2

RAILS
RELAYING — TRACK ACCESSORIES
NEW — MIDWEST STEEL CORP.
502 CAPITOL STREET
CHARLESTON, W. VA.
IMMEDIATE DELIVERY

For Sale
100 pcs.—New 60 foot lengths—18 gauge x 12" dia. Armco Welded Pipe Shells.
16 pcs.—New 18 foot lengths—16" dia. U.S.J.T. cement lined pipe-rings, gaskets, bolts.

E. & E. J. PFOTZER, INC.
P. O. Box 126, WILMINGTON, DELAWARE

Locomotives, 10 to 100 tons, std. & 36" gauge.
B-Monighan Walking draglines, 9W-7W-5W-200W.
Page 10-yd. diesel Walking dragline, 140' bm.
Shovels, draglines, cranes, 1½ to 10 yds. (15).
Electric cranes, shovels, drgls. Derrick boats.
Whirley portal gantry cranes, 30-60 tons.
Dredges, diesel, elec., steam, 20", 16", 14", 12".
Universal 24x36 jaw, and 26" gyratory crusher.

H. Y. SMITH CO.
828 N. Broadway Milwaukee 2, Wis.

RAILS - TIE PLATES
Frogs & Switches—Track Accessories

W. H. DYER CO., INC.
2110-X Railway Exchange Bldg., St. Louis 1, Mo.

Need Air?

CALL

AMERICAN AIR of JERSEY

AIR FOR SALE OR RENT
SINCE 1902

GAS • DIESEL • STEAM • ELECTRIC

New and Quality Rebuilts

STATIONARY

48.6 CFM 3500 psi stage Ingersoll Rand 25 HP Elec
122 CFM 100 psi 7x7 Worthington HB 20 HP Elec
125 CFM 100 psi 6¼ x 4½ Davey VB9 6 available
142 CFM 125 psi 6/6/5x5 Worth M-25 25 HP Elec
254 CFM 125 psi 10x10 Ingersoll ER-1 40 HP Elec
268 CFM 500 psi 10/4¼x10 Ingersoll 75 HP Synch.
270 CFM 125 psi Joy WL-60 2 available
278 CFM 125 psi 2 Stage Chicago PB 50 HP Elec
285 CFM 125 psi 2 Stage Gardner "WB" 50 HP
289 CFM 100 psi 3 cylinder Davey 50 HP Elec
291 CFM 40 psi 3 cylinder Ingersoll Type 40 Two available
295 CFM 125 psi 10x11 Chicago T-B 2 available
312 CFM 100 psi 4 cyl. Gardner "AAG"—60 HP
343 CFM 500 psi 11/5x13 Worth. HB2 Elec or steam
364 CFM 20 psi 12 x 7 Gardner "RX" 2 available
435 CFM 100 "Unitair" Joy WL-60 75 HP Elec
552 CFM 125 13/8x10 Ingersoll 100 HP Elec
560 CFM 125 psi 2 stage Chicago PB8 100 HP Elec
782 CFM 110 psi 15½/9¾x10 Worth DC-2 125 HP
931 CFM 55 psi 17x13 Chicago T-B Steam or Elec
1085 CFM 35 psi 20x12 Penn 3-c. 100 HP Elec
1574 CFM 100 psi 22/14x16 IR-PRE 2 available
1574 CFM 50 psi 15/15x14 Penn DB-1 200 HP Elec
1723 CFM 110 psi "XPV" 4 corner Ingersoll Steam

SPECIAL Compressors for special air applications and conditions
PORTABLE 15 CFM to 600 CFM
VACUUM PUMPS 3 CFM to 5881 CFM
DELIVERIES Always prompt

American
AIR COMPRESSOR CORP.
DELL AVE & 48th ST. NORTH BERGEN, N. J.
Telephone UNion 5-4848

EQUIPMENT SALE

1—Mod. 54B Bucyrus Erie comb. Shovel & Dragline, Ser. No. 45411 ..... $35,000.00
1—Mod. 54B Bucyrus-Erie Shovel, Ser. 51800 ..... $30,000.00
3—500 CFM Gardner Denver Portable Air Compressors, pow. by Cat. D13000 diesel engines (1950) ..... $ 4,000.00 ea.
2—Joy 3-drum Slusher Hoists, powered by 60 HP electric Motors ..... $ 2,000.00 ea.
1—Bucyrus-Erie Mod. 29T Blast Hole Drill ..... $ 5,000.00
2—Rex Mod. 200 Pumpcretes ..... $ 9,000.00 ea.
2—Koehring Mod. 60 Dumptors ..... $ 3,000.00 ea.
2—Euclid Mod. 27FD (9.7 yds.) end dump Trucks ..... $ 7,500.00 ea.
1—15 ton Cableway with 1300' of 2-½" Lock Coil Cable, operated by 250 HP electric-driven three-drum Hoist $10,000.00
1—Robinson Mod. 50 Cement Unloader .. $ 3,500.00
1—100 ton American diesel elect. Locomotive $35,000.00

GUY F. ATKINSON COMPANY

10 West Orange Ave. So. San Francisco, Calif.
Phone: Plaza 6-0300, Ext. 125

FOR SALE

DIESEL ELECTRIC LOCOMOTIVES

25 - 44 - 45 - 65 - 75 tons
STANDARD GAUGE
5 - 35 ton - 36" gauge
Write for Details

FRANK M. JUDGE & CO., INC.
7010 Empire State Building
New York 1, N. Y.

SHOVELS ★ BACKHOES ★ CRANES

1. 1952 Lima 34-T Truck Crane with 60 ft. boom and 15 ft. jib. 700 miles on truck engine. Excellent mechanical condition ..... $22,000.
2. Lorain 75-D, 1½-yard crawler crane with 60 ft. boom. Waukesha gas engine ..... 6,500.
3. Koehring 205 Crawler Crane and Backhoe combination. Gas power. No repairs necessary ..... 7,000.
4. Lorain Model 50-I one-yard Crawler Clamshell with Owens Bucket. Caterpillar diesel engine. 80% new ..... 16,500.

FRANTZ EQUIPMENT COMPANY

50th & Wynnefield Avenue *GReenwood 7-7200* Philadelphia 31, Penna.

PILE DRIVING EQUIPMENT

Vulcan and McKiernan-Terry
Steam Pile Hammers and Extractors
Drop Hammers - Driving Caps
Steel Leads - Pile Driver Hose
Hoists and Boilers

CONTRACTORS MACHINERY CO.
Phone VAlentine 4740
2637 SOUTHWEST BLVD.
KANSAS CITY 8, MO.

CONCRETE PLANT EQUIPMENT

2—Johnson 150 cubic yard Concrete Plants, 3 aggregate and 1 cement compartment, 2 cubic yard aggregate and cement weight batchers, 520 barrel auxiliary cement bin with truck hopper, elevator and screw conveyor. Outfit has aggregate truck hopper and bucket elevator. Plants include 2 each of Ransome 28S Mixers.

Subject to prior sale

FRAZIER-DAVIS CONSTRUCTION COMPANY

1319 Macklind Avenue, St. Louis, Mo. STerling 1-1950
Box 188—Grahamsville, New York Grahamsville 2861

USED EQUIPMENT FOR SALE

1—10-B Bucyrus-Erie Shovel
1—Model "L" Quick-Way 30′ Crane (new)
1—375-BC American ¾ Yd. Shovel and 55′ boom, diesel engine (1952)
1—TL-20 Lorain Moto Crane, 30′ boom, mounted on Moto carrier
1—22-B Bucyrus-Erie Clamshell, GM diesel, also shovel attachment
1—200 Osgood ½ Yd. Crane
1—200 Osgood ½ Yd. Backhoe
3—LD-5 Scoopmobiles
20—Ingersoll-Rand Compressors—600, 315, 210—Wagon Drills—Breakers, etc.
1—9B3 McKierman Terry Hammer
1—50′ set pile leads for M. T. Hammer
5—K5 Nelson Model K Bucket Loaders, pneumatic tired
1—Meili-Blumberg Model 44 gas powered Grader (demonstrator)
1—Barber Green Bucket Loader on crawler
2—Caterpillar D7 Tractors with LeTourneau PCU and Tilt Blade
1—International TD-18 Tractor, diesel, B.E. hydraulic bulldozer
1—Caterpillar D4 Tractor with ¾ cu. yd. Traxcavator
1—Rex 160 Single Pumpcrete
1—Rex 200 Single Pumpcrete
1—Rex 200 Double Pumpcrete
Clamshell Buckets—⅜, ½, ⅝, ¾, 1 Yard

FURNIVAL MACHINERY CO.
54th at Lancaster Ave., Phila 31, Pa • TR 7-5200

TRENCH MACHINE
BUCKEYE MODEL 302
Equipment to lay field tile.
Will dig to depth 5-½ ft. and up to 24" wide with side cutters.
New, Oct. 1953. Excellent condition.
PRICE $6,500.00
ANDERSON EQUIPMENT CO.
Box 1737, Pittsburgh 30, Penna.
Phone: LEhigh 1-6020

LOW COST INSTALLATION AND OPERATION

CABLEWAYS
IMMEDIATE SHIPMENT
ELECTRIC, STEAM OR DIESEL
CAPACITY 3 TO 20 TONS
SELL, RENT OR BUY

FOR DAMS, BRIDGES, BREAKWATERS, FILTRATION AND SEWERAGE PLANTS
FOR SPEED, ECONOMY, EFFICIENCY, FLOOD SAFETY, LABOR REDUCTION

AMBURSEN DAM CO. INC.
295 MADISON AVE. NEW YORK

PILING

SURPLUS NEW and USED For Sale or Rent

We do a Nation-Wide business in
STEEL SHEET PILING

IMMEDIATE SHIPMENT
685 pcs. 68-38 ft. Carn. MP-101—West Coast
396 pcs. 60-50 ft. M-116 & M-115—Illinois
400 pcs. 60-30 ft. Beth. DP-2—New York
504 pcs. 60 ft. M115, M112, M116—Kansas City
80 pcs. 50 & 40 ft. Carn. M-112—N. Dakota
196 pcs. 60 ft. Beth DP-2—Alabama
130 pct. 30 ft. Carn M-115, Ohio.

Other Lengths & Sections at Various Locations

PILE DRIVING EQUIPMENT

Vulcan and McKiernan-Terry Steam Pile Hammers and Extractors Hoists and Boilers

MISSISSIPPI VALLEY EQUIPMENT CO.
509 Locust St., Chestnut 1-4474, St. Louis, Mo.

JUST RELEASED!
900 Tons of MP-101 STEEL SHEET PILING
Every Desirable Length up to 60 ft.

SPECIALLY PRICED
Attractive Savings for Western—Mountain and Gulf States Delivery.

GET OUR QUOTATIONS
Offer Subject To Prior Commitment

H-BEARING PILE • PIPE for PILING

L. B. FOSTER CO.
1721 Commerce Bldg. Houston 2, Tex.
3460 Wilshire Blvd. Los Angeles 5, Cal.
CHICAGO 4, PITTSBURGH 30, NEW YORK 7

STEEL SHEET PILING

600—Pcs. M-116 in 40 to 60′—Chicago
130—Pcs. M-115 in 50 to 60′—Chicago
140—Pcs. M-112 in 60′—Chicago
300—Pcs. M-116 in 50 to 60′—Kansas City
100—Pcs. M-115 in 50′—Kansas City
105—Pcs. M-112 in 60′—Kansas City
83—Pcs. M-112 in 25 to 50′—North Dakota
100—Pcs. I-23 in 12 to 16′—Illinois
86—Pcs. M-116 in 29 to 30′—Southern Illinois
49—Pcs. I-22 in 30′—Wisconsin

Available for Prompt Shipment
Other Lots at Various Locations

CONTRACTORS MACHINERY CO.
Phone VAlentine 4740 2637 SOUTHWEST BLVD KANSAS CITY 8, MO

FOR SALE
STEEL SHEET PILING
AT CHIEF JOSEPH, WASHINGTON
Shipped New—Used Only One Job

CARNEGIE Length	MP-101 Pcs.	MP-102 Pcs.	TEES Pcs.
72-65 ft.	105	100	2
65-60 ft.	210	80	9
60-50 ft.	210	5	18
50-45 ft.	290	2	7
45-40 ft.	120	1	13

Also quantity shorter than 40 ft.—Quick shipment regardless of job location, write, wire or phone.

MISSISSIPPI VALLEY EQUIPMENT CO.
509 Locust St., CHestnut 4474, St. Louis 1, Mo.

STEEL SHEET PILING—SOLD, RENTED
100 Tons Beth. SP-4—40 Ft. in Quebec.
1800 Pcs. Beth. DP2 & AP3, 60, 55, 50, 45, 40, 35, 20 & 15 Ft. in N. J., Ohio, Va., N. Y., Penna., Ga.
265 Pcs. Beth. DP-1—20 to 24 Ft. N. J.
300 Pcs. Z—25 Lb., 20 Ft. N. Y.
1200 Pcs. New SP-4, 46 Ft. Illinois.
300 Pcs. Beth. SP4—60-70 Ft. New Jersey.
Agents Wanted To Rent Piling

STANHOPE 60 E. 42nd St., N. Y. 17, N. Y.

BAILEY BRIDGES

Quickly-erected, Sturdy, Reusable
Spans up to 200 feet
Economical and Adaptable

MASON & BACON CO.
McClure Bldg., Frankfort, Ky.

RENT STEEL SHEET PILING

Get the exact lengths and sections you need from Foster—all standard makes, delivered *on time*—and at Foster's standard low rental rates. Also Rental Pile Hammers & Extractors.

L. B. FOSTER CO.
PITTSBURGH 30 • NEW YORK 7 • CHICAGO 4
HOUSTON 2 • LOS ANGELES 5

GREENHEART
Specified for all types heavy marine construction as
FENDER PILING, RUBBING TIMBERS
DOLPHINS
Used by Corps of Engineers, many railroads, port authorities and other waterfront owners
GREENHEART (Demerara) Inc.
52 Vanderbilt Ave New York MU 6-0410

FOR SALE OR RENT
Bethlehem DP2 New Steel Sheet Piling
220 pieces 60 ft. long in Georgia
Can Ship Immediately In Carload Lots
MISSISSIPPI VALLEY EQUIPMENT CO.
511 Locust St., CHestnut 1-4474, St. Louis 1, Mo.

FOR SALE

615 Page Walking Dragline, 120' boom, 4 yd. Bucket. Reasonably priced for quick sale.

FDE Cletrac Angledozer, Seriel #11-Y752, new tracks, new grousers, low hours, like new condition.

315 Worthington Air Compressor, Hercules Diesel Engine, mounted on GMC 6x6 truck, good condition.

D7 Caterpillar, Serial #3T-21303, with 7S Straight Blade, and #25 Rear Cable Control, A-1 condition.

Hough Payloader, Model HLD, with International Diesel engine, 1¾ yard bucket.

W. N. DIPPEL & CO.
Box 313 - GLadstone 4-5761
Hazleton, Pennsylvania

FOR SALE
BUCYRUS 375 DRAGLINE
WARD LEONARD CONTROLS
150' Boom—9-½ Yard Dragline Bucket
—Good Condition
FORSYTHE EQUIPMENT CO., INC.
37-11 Vernon Blvd., Long Island City 1, N. Y.

FOR SALE OR RENT—EASY TERMS
Rebuilt — A 1 Condition
48B Bucyrus Erie Shovel 2 cy Diesel
Model 25 N.W. Shovel ¾ cy diesel
Caterpillar Auto Patrol No. 12
Caterpillar D8 Bulldozer
Caterpillar Scraper Model 80
3—Caterpillar DW 10's
WILLIAMS CONSTRUCTION COMPANY
Box 145 Balto. 20, Md. Murdock 6-6600

SCRAPERS For Sale or Rent

8—Euclids, 1951 Scrapers, 15.5 cu. yd., Cummins diesel, machines and tires excellent condition.

6—LeTourneau 12 cu. yd. 1950 and 1951 Tournapull C Roadsters, Cummins, GM, Buda diesel, tires excellent condition.

2—Super C Tournapulls, 12 yd., Cummins diesel, bargain, $3,000.00 ea.

3—Wooldridge Terracobras, 15 yd., Cummins diesel, good tires, bargain, $3,500.00 ea.

GIL BOERS EQUIPMENT CO.
7625 S. Kedzie Ave. Chicago 29, Ill.

Stiff Leg Derricks 10 to 100 Ton
Guy Derricks, 20 to 45 Ton Capacity
Hoists Elec. Gas, Steam
Steam Hoist 10 x 12 Cyl, 3 drum
3½ Yd Page Diesel Elec Walker Dragline
40 ton Locomotive, Gas Elec.
125 ton Locomotive, Diesel Elec. 1000 HP.
Locomotive Cranes—Gantry Cranes
Manitowoc Model 3000-B 145 Ft Boom, rental only
20" Electric suction Dredge
STONE THE CRANE MAN
1132 Prudential Bldg. Buffalo 2, N. Y.

FOR SALE
STEEL BARGES - DREDGES
TUGS - WORK BOATS - LIGHTERS
For Every Purpose
H. J. BRANIGAN & COMPANY
75 West Street, New York 6, N. Y.
Telephone: Bowling Green 9-6760

Nearly new P. & H. 655-B
ERECTION CRANE-DRAGLINE Ser. #15260
D-13000 Cat. Diesel, 30-ton capacity, 70' boom, 25' jib. Telescopic pipe boom stop. High gantry. Fairleads, Tagline. Extra counterweight all around catwalk. New July 1952—only been used for crane work. $25,000.00. Consider rental purchase.
WENZEL MACH. CO.
565-567 S. 10th Kansas City, Kans.

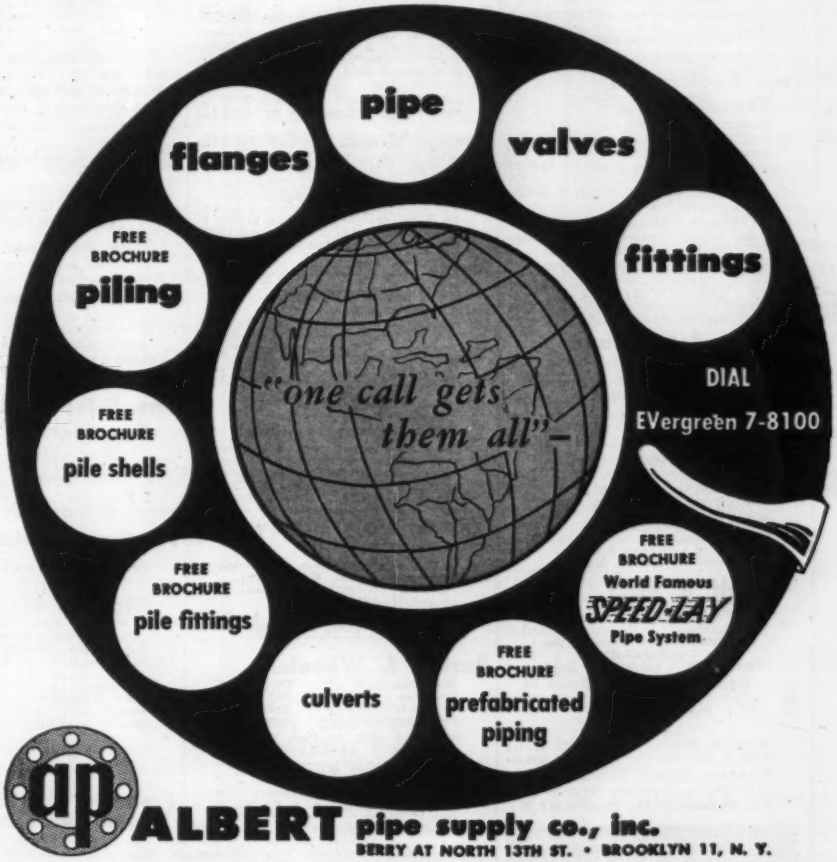
FOR SALE
ELEVATED WATER TANK
100,000 Gallons Capacity with 100 ft. steel tower—either rebuild wood tank or new flat bottom steel tank. Complete accessories—erected anywhere and guaranteed. Design conforms to all recognized standards. Smaller sizes also available.
FRANK J. UEHLEIN
P. O. Box 656 Wantagh, N. Y.

LOCOMOTIVE

One IR-G.E.—105 Ton Diesel Electric Locomotive
FOR SALE
No reasonable offer turned downed
Wire or Write to
Construction Service Company
P.O. Box 311 Bound Brook, N. J.

PIPE

SURPLUS NEW and USED FOR SALE



ALBERT pipe supply co., inc.
BERRY AT NORTH 13TH ST. • BROOKLYN 11, N. Y.

NEW BLACK STEEL TESTED PIPE

2500 feet O.X.X. .344 Wall, B.E., Gr. B., API 5 L, Electric Weld, Double Random lgths.

4000 feet O.D. X .344 Wall, B/E., Gr. B., API 5 L, Electric Weld, Double Random lgths.

2000 feet O.D. X .330 Wall, B.E. Gr. X42, Electric Weld, Double Random lgths.

ATTRACTIVE PRICES—IMMEDIATE DELIVERY

GLOBE PIPE & FITTING CO.
785 Metropolitan Ave. B'klyn 11, N. Y.
Evergreen 7-6220-1

PIPE

15,000 feet 6" steel pipe
10,000 feet 4" steel pipe

Both equipped with roller grip couplings suitable for air or water.

Subject to prior sale

FRAZIER - DAVIS CONSTRUCTION CO.
1319 Macklind Avenue, St. Louis, Mo.
ST erling 1-1950
Box 188 Grahamsville, New York
Grahamsville 2861

CONTRACTORS NEED USED PIPE . . . *Quickly* . . .

use this section as a buying reference. Keep your advertisement on this page if you can supply them.

EST. 1904
DAVIDSON
PIPE COMPANY INC.
One Of The Largest Stocks In The East
Seamless and Welded ⅛" to 26" O.D. All wall thickness Manufactured. Specialty large sizes. Cutting — Threading — Flanging — Fittings — Valves.
Call GEdney 9-6300
50th St. & 2nd Ave., B'klyn 32, N. Y.

PROFESSIONAL SERVICES

Cards arranged by areas, states, cities, names

Additional cards on following pages

NEW ENGLAND

Engineering Services Inc.

Foundation Investigations,
Soil Testing & Test Borings
Minerals Exploratory
Service

119 New London Tnpk. Glastonbury, Conn.

Goodkind & O'Dea

Consulting Engineers

Design and Supervision
Foundations, Structures, Highways

1214Dixwell Ave. Hamden, Conn.
125 Church St. Malverne, N. Y.
313 Hoover Ave. Bloomfield, N. J.

Fay, Spofford & Thorndike

Engineers

John Ayer Ralph W. Horne
Blon A. Bowman William L. Hyland
Carroll A. Farwell Frank L. Lincoln
Howard J. Williams
Members, American Society of Civil Engineers

Airports, Bridges, Turnpikes
Water Supply, Sewerage and Drainage
Port and Terminal Works
Industrial Buildings

Designs Investigations
Supervision of Construction
Boston New York

Jackson & Moreland

Engineers and Consultants

Design and Supervision of Construction
Reports—Examinations—Appraisals
Machine Design—Technical Publications
Boston New York

Chas. T. Main, Inc.

Engineers

Design and Supervision of
Construction for Industrial Plants
Electrical, Steam and
Hydraulic Engineering
Investigations, Reports and Appraisals
Chamber of Commerce Bldg.
80 Federal St., Boston, Mass.

Metcalf & Eddy

ENGINEERS

Investigations Reports Design
Supervision of Construction
and Operation
Management Valuation Laboratory

1300 Statler Building, Boston 16

C. W. Riva Co.

Engineers

Edgar P. Snow Robert C. Barker
John F. Westman John H. Grauss

Highways, Bridges, Tunnels, Airports, Foundations, Sewerage, Water Supply.

511 Westminster St., Providence 3, R.I.

MIDDLE ATLANTIC

Airways Engineering Corp.

Airports, highways, dams, fuel storage, pipe lines, aerial topographic mapping.
1212 - 18th St., N.W.,
Washington 6, D. C.
Phone: REpublic 7-8131.

Alster & Associates, Inc.

Photogrammetric Engineers

Topographic Mapping, Planning, Surveying, Map Consultants, Photo Mosaics.
6135 Kansas Ave., N. E.
Washington 11, D. C.
Phone: Taylor 9-1161

Oscar Sutermeister

Consultant on Defense Planning

Reduction of Vulnerability to Atomic and Hydrogen Bomb Attack—Industrial and Urban Dispersion—Protective Construction—Underground Relocation

5923 Johnson Ave. Bethesda 14, Md.

Whitman, Requardt & Associates

Engineers—Consultants

Civil—Sanitary—Structural
Mechanical—Electrical

Reports, Plans, Supervision, Appraisals
1304 St. Paul St., Baltimore 2, Md.

Greer & McClelland

Consulting Foundation Engineers

SOIL INVESTIGATIONS

Borings
Laboratory Tests
Foundation Designs & Analyses
Reports

98 Greenwood Ave. Montclair, N. J.
2649 N. Main St. Houston, Texas

Edwards, Kelcey & Beck

Reports, Design Supervision, Expressways, Port & Harbor Works, Terminals, Tunnels, Bridges, Water Supply, Industrial Plants, Traffic and Management Studies.

3 William Street Newark 2, N. J.
New York Boston Philadelphia

Porter, Urquhart & Beavin

O. J. Porter & Co.
Consulting Engineers
Airports-Highways-Dams-Structures
Foundations-Stabilization-Pavements
415 Frelinghuysen Ave., Newark 5, N.J.
76 Ninth Ave., New York 11, N. Y.
3568 West Third St., Los Angeles 5, Calif.
516 Ninth St., Sacramento 14, Calif.

Frank E. Harley and Associates

Consulting Engineers

Design, Surveys, Plans and Construction Highways, Sewerage and Sewage Treatment, Water Supply and Purification, Municipal Problems.
Harley Bldg., 260 Godwin, Wyckoff, N. J.

B. K. Hough

Consulting Engineer
Soils & Foundation Engineering

Site investigations, soil testing, design analysis for earthworks, foundations and pavements, field inspection, engineering reports, consultation.
121 E. Seneca St., Ithaca, New York

Ammann & Whitney

Consulting Engineers

Design — Construction Supervision
Bridges, Highways, Expressways, Buildings, Special Structures, Airport Facilities
76 Ninth Avenue, New York 11, N. Y.
724 E Mason Street, Milwaukee 2, Wis.

Barker & Wheeler

Water Supply — Utility and Industrial
Sewerage — Industrial
Sewage Disposal — Valuations
Power Systems — Reports

New York City, 11 Park Place
Albany, N. Y. 36 State St.

Bogert and Childs

Consulting Engineers

Clinton L. Bogert Fred S. Childs
Ivan L. Bogert Donald M. Ditmars
Robert A. Lincoln Charles A. Manganaro
William Martin

Water & Sewage Works Refuse Disposal
Drainage Flood Control
Highways & Bridges Airfields

624 Madison Avenue, New York 22, N.Y.

Bowe, Albertson & Associates

Engineers

Water and Sewage Works—Industrial Wastes—Refuse Disposal—Municipal Projects—Airfields—Industrial Buildings—Reports—Designs—Estimates—Valuations—Laboratory Service.

110 William St., New York 7, N. Y.

Builders Estimating Service

Cost Estimates
Quantity Estimates
Material Purchase Lists

140 Nassau St., New York 38, N. Y.
COrtlandt 7-0322.

Brown & Blauvelt

CONSULTING ENGINEERS

Expressways, Highways, Parkways
Airports, Bridges, Dams, Water Supply

Industrial and Chemical Plants
Sewage Disposal

Preliminary Reports, Engineering
Design, Construction Supervision

488 Fourth Ave., New York 16, N. Y.

Buck, Seifert & Jost

Consulting Engineers
(Formerly Nicholas S. Hill Associates)

Water Supply — Sewage — Hydraulic Developments, Reports and Valuations. Chemical and Biological Laboratories.
New York City, 113 E. 19th St.

Cotton, Pierce, Streander, Inc.

Associated Engineering Consultants

Water Supply, Treatment, Distribution
Sewage, Sewage Treatment
Refuse Disposal, Trade Wastes
Power Plants
Reports, Plans, Supervision

132 Nassau St., New York, N. Y.
PO Box 198, Hyde Park 36, Mass.
1405 W. Erie Ave., Phila. 40, Pa.
55 Caroline Rd., Gowanda, N. Y.

Ebasco Services Inc.

ENGINEERS
CONSTRUCTORS
BUSINESS CONSULTANTS

Design and Construction
Financial and Operating Consultation
Investigations and Reports
Consulting Engineering

Two Rector Street New York
209 S. LaSalle Street Chic. 4, Ill.
1625 I Street, N.W. Wash. 6, D. C.

The Giles Drilling Corporation

Engineering Geology Reports
Foundation Investigations
Soil Testing & Test Borings

2 Park Ave New York 16, N. Y.

Hardesty & Hanover

Consulting Engineers

Bridges
Long Spans of All Types
Movable—Lift, Bascule and Swing
Hanover Skew Bascule
Steel and Concrete Spans
Grade Crossing Eliminations

Expressways and Thruways
Other Structures
Foundations
Supervision, Reports, Appraisals

101 Park Avenue, New York 17, N. Y.

Frederic R. Harris, Inc.

CONSULTING ENGINEERS

F. H. Deehant, E. J. Quirin,
E. H. Harlow

Harbors, Piers & Bulkheads, Drydocks.
Foundations, Soil Mechanics.
Sanitary & Industrial Waste Disposal.
Water Supply, Flood Control.
Airports, Highways, Bridges.
Power, Industrial Plants, Buildings.

27 William Street New York
3 William Street Newark
Fidelity Phila. Trust Bldg. Philadelphia

Hazen & Sawyer

Engineers

Richard Hazen Alfred W. Sawyer
Water and Sewage Works,
Industrial Waste Disposal,
Drainage
Reports, Design, Supervision
of Construction and Operation

110 East 42nd St., New York 17, N. Y.

Knappen-Tippetts-Abbett-McCarthy

Engineers

Ports, Harbors, Flood Control, Power, Dams, Bridges, Tunnels, Highways, Subways, Airports, Traffic, Foundations, Water Supply, Sewerage, Reports, Design, Supervision, Consultation.

62 West 47th Street, New York City

Howard, Needles, Tammen & Bergendoff

Consulting Engineers
Bridges and Structures

New York, N. Y., 55 Liberty St.
Kansas City, Mo., 1805 Grand Ave.

Moran, Proctor Mueser & Rutledge

Consulting Engineers

Foundations for Buildings, Bridges and Dams; Tunnels, Bulkheads, Marine Structures; Soil Studies and Tests; Reports, design and supervision.

New York 17, N. Y. 420 Lexington Ave.

PARDO, PROCTOR, FREEMAN & MUESER
Ap. Corrfos 614 Caracas, Venezuela

Parsons, Brinckerhoff Hall & Macdonald

ENGINEERS

Bridges, Highways, Tunnels, Airports, Subways, Harbor Works, Dams, Canals, Traffic, Parking and Transportation Reports, Power, Industrial Buildings, Housing, Sewerage and Water Supply.

51 Broadway, New York 6, N. Y.

E. Lionel Pavlo

Consulting Engineer

Design, Supervision, Reports
Bridges, Highways, Expressways
Marine Structures, Public Works
Industrial Construction, Airports

7 E. 47th St. New York 17, N. Y.

Malcolm Pirnie Engineers

Civil & Sanitary Engineers

Malcolm Pirnie Ernest W. Whitlock
Robert D. Mitchell Carl A. Arenander
Malcolm Pirnie, Jr.

Investigations, Reports, Plans
Supervision of Construction
and Operations.

Appraisals and Rates

25 W. 43rd St., New York 36, N. Y.

The Pitometer Associates

Engineers

Water Waste Surveys
Trunk Main Surveys
Water Distribution Studies
Water Measurements & Special Hydraulic Investigations

New York, 50 Church St.

Alexander Potter Associates

Consulting Engineers

Water Works, Sewerage, Industrial Waste, Hydraulic Works, Reports, Designs, Appraisals.

50 Church St., New York, N. Y.

Clyde Potts Assoc.

Weston Gavett-Stanley N. Williams
Consulting Sanitary Engineers

Sewerage and Sewage Disposal
Water Works and Water Supply
Valuations and Appraisals

30 Church Street, New York 7

Preload Engineers Inc.

Founded - 1934

Consultants in Prestressed Design

Designers of more than 800 prestressed concrete bridges, buildings, tanks and high pressure pipe lines erected in North America since 1934.

Orson Dobell *Cedric Steiner*
Morris Schupack *E. H. Thweitt*

3333 Connecticut Ave., N.W.,
Washington 8, D. C.

PROFESSIONAL SERVICES

Cards arranged by areas, states, cities, names — Additional cards on preceding and following pages

Sanderson & Porter

Engineers and Constructors

Reports and Surveys

New York, New York

Seelye Stevenson Value & Knecht *Consulting Engineers*

Richard E. Dougherty, Consultant

Airports, Highways, Bridges, Dams, Water Supply, Sanitation, Railroads, Piers, Industrial Plants, Reinforced Concrete, Steel, Industrial Waste Disposal, Foundations, Soil Studies, Real Estate Development

Civil — Mechanical — Electrical

101 Park Avenue New York 17, N. Y.

Scheidenhelm, F. W.

Consulting Engineer

Hydraulic Engineering; Hydro-electric Development; Water Supply; Flood Control; Engineering Problems relating to Water Rights and Water Power Law; Appraisals. 50 Church Street, New York 7, N. Y.

Severud-Elstad-Krueger

Consulting Engineers

Structural Design - Supervision
Reports - Buildings - Airports
Special Structures

415 Lexington Avenue
New York 17, N. Y.

Singstad & Baillie

Consulting Engineers

Ole Singstad David G. Baillie, Jr.

Tunnels, Subways, Highways
Foundations, Parking Garages

24 State St. New York 4, N. Y.

Frederick Snare Corporation

Engineers—Contractors

Harbor Works, Bridges, Power Plants, Dams, Docks and Terminals.
Difficult and Unusual Foundations A Specialty.

233 Broadway, New York City 7

Havana, Cuba Lima, Peru
Bogota, Colombia, Caracas, Venezuela,
San Juan, Puerto Rico, Guayaquil, Ecuador.

D. B. Steinman

Consulting Engineer

BRIDGES

Design, Construction
Strengthening, Investigations, Reports, Advisory Service

117 Liberty St., New York 6, N. Y.

Henry W. Taylor

Consulting Engineer

Water Supply, Sewerage
Refuse Disposal, Incineration
Industrial Developments

151 W. Merrick Rd, Freeport, N.Y.

The J. G. White Engineering Corporation

Design - Construction
Reports—Appraisals

80 Broad Street, New York

Keis & Holroyd

Consulting Engineers

Formerly Solomon & Keis
Since 1906
Water Supply, Sewage Disposal, Garbage & Refuse Incineration, Industrial buildings.

Troy, N. Y. Ft. Lauderdale, Fla.

Capitol Engineering Corporation

Engineers—Constructors—Management

Bridges Dams
Planning Airports
Sewage Systems Water Works
Design and Surveys Roads & Streets
Executive Offices Dillsburg, Penna.

Gannett Fleming Corddry & Carpenter, Inc.

ENGINEERS

Dams, Water Works, Sewage, Industrial Wastes & Garbage Disposal, Highways, Bridges & Airports, Traffic & Parking -Appraisals, Investigations & Reports.

Harrisburg, Penna.

Branch Offices

Pittsburgh, Pa. Philadelphia, Pa.
Daytona Beach, Fla., Pleasantville, N. J.

Modjeski and Masters

Consulting Engineers

Design, Supervision, Reports, Inspection and Investigations, of Bridges, Structures, and Foundations.

State Street Bldg. 33rd and Arch Sts.
Harrisburg, Pa. Philadelphia 4, Pa.

Aero Service Corporation

Photogrammetric Engineers

Aerial Topographic Maps
Precise Photo Mosaics
Plastic Relief Models

236 E. Courtland St.
Philadelphia 20, Pa.

Albright & Friel, Inc.

Consulting Engineers

Water, Sewage and Industrial Wastes Problems, Airfields, Refuse Incinerators, Dams, Power Plants, Flood Control, Industrial Buildings, City Planning, Reports, Appraisals and Rates, Laboratory.
121 So. Broad St., Philadelphia 7, Pa.

Day & Zimmermann, Inc.

Engineers

Designs, Construction, Valuations
Reports and Management
Public Utilities and Industrials

New York Philadelphia Chicago

Frederick H. Dechant

Consulting Engineer

Chairman of the Board
Frederic R. Harris Inc.
Water Works, Industrial Wastes, Sewerage, Recovery Processes, Hydraulic Works, Gas Plants.
Philadelphia: Fidelity Phila. Trust Bldg. New York: 27 William St.

Fridy - Gauker - Truscott & Fridy

Architects & Engineers

Water Sewerage - Industrial Waste
Incineration - Power & Distribution
Airport - Building - Town Planning
1321 Arch Street - Philadelphia 7, Pa.

Yule, Sticklen, Jordan & McNee

ENGINEERS

(Formerly General Industries Engineering Company)
Bridges, Highways, Airports
Design, Investigations, Reports
Supervision of Construction
Civil, Structural, Mechanical & Electrical

309 South Broad St. 23rd & Market Sts.
Philadelphia 7, Pa. Camp Hill, Pa.

Hunting, Larsen & Dunnells, *Engineers*

Industrial Plants—Warehouses, Office and Commercial Buildings. Steel and Reinforced Concrete. Design and Supervision. Reports.

1150 Century Bldg., Pittsburgh, Pa.

Morris Knowles Inc.

Engineers

Water Supply and Purification Sewerage and Sewage Disposal, Valuations, Laboratory, City Planning.

Pittsburgh, Pa.

Gilbert Associates, Inc.

Engineers • Consultants • Constructors

607 Washington St., Reading, Pa.

Engineering • Construction Supervision
Sanitary • Power • Water • Sewerage
Industrial Relations • Rate-Research

New York • Philadelphia • Washington

Michael Baker, Jr., Inc.

Consulting Engineers

Civil Engineers, Planners, Surveyors; Airports, Highways, Water & Sewerage Design; Aerial Topographic Maps; Dams; Irrigation; Reports; All types surveys. Home Office: Rochester, Pa.; Branch Offices: Jackson, Miss., Harrisburg, Pa.

Weigle Engineering Co.

CIVIL ENGINEERS

William E. Weigle Donald K. Weigle
Sewers, Bridges, Municipal Work
Design and Construction Supervision
Estimates and Flood Control

30 N. Duke St., York, Pa.

SOUTH

Ewin Engineering Corporation

Designers of Port Facilities, Foundations, Industrial Plants, Bridges, Highways, Sewage Disposal and Municipal Projects.
P O Box 361, Mobile, Alabama
Jackson, Mississippi, Washington, D.C.

Polk, Powell and Hendon

Consulting and Designing Engineers

Municipal and Industrial Works.
Investigations and Reports
621 Stallings Building,
Birmingham 3, Alabama

Palmer and Baker, Inc.

Consulting Engineers - Architects

Surveys-Reports-Design-Supervision Consultation

Transportation and Traffic Problems
Tunnels-Bridges-Highways-Airports
Industrial Buildings
Waterfront and Harbor Structures
Graving and Floating Dry Docks
Complete Soils, Materials and Chemical Laboratories

Mobile, Ala New Orleans, La.
Harvey, La.

James and Baxter Associates, Inc.

Architects & Engineers

A complete professional service
Architectural, Civil, Industrial, Municipal

2962-64 Coral Way Miami 34, Fla.

Duval Engineering & Contracting Co.

General Contractors

FOUNDATION BORINGS
For Engineers and Architects.

Jacksonville, Florida

Rader Engineering Co.

Water Works, Sewers, Refuse Disposal, Ports, Harbors, Flood Control, Bridges, Tunnels, Highways, Airports, Traffic, Foundations, Buildings, Reports, Investigations, Consultations.

111 N.E. 2nd Ave., Miami 32, Florida

Law-Barrow-Agee Laboratories, Inc.

Soils Engineers & Consultants

Soil Testing—Soil Boring—Rock Drilling—Load Testing—Field Control —Engineering Studies—Chemical Analysis—Physical Testing
Box 13558 Atlanta 1, Ga.
Serving the entire South

Patchen & Zimmermann

Engineers

Construction Plans, Cofferdams, Structures, Industrial Plants, Dams, Sewerage and Sewage Treatment, Water Supply and Treatment. Supervision, Surveys, Reports.

Augusta, Ga. Anniston, Ala.

Eustis Engineering Company

FOUNDATION AND SOIL MECHANICS INVESTIGATIONS

Soil Borings *Laboratory Tests*
Foundation Analyses *Reports*

3535 Airline Highway
New Orleans 26, La.

Paulson Engineering Services, Inc.

Consulting Engineers

Marine Engineering, Dredge Design, Dredging Job Estimates, Land Reclamation Development.

P. O. Box 341 Charleston, S. C.

Schmidt Engineering Co.

Consulting Engineers

Investigations, Reports, Designs, Supervision Heavy Construction—Dams and Hydroelectric Projects—Foundation Explorations and Treatment—Water and Sewerage Works — Bridges & Highways

817 Broad St. Chattanooga 2, Tenn.

MIDDLE WEST

Alvord, Burdick & Howson

CONSULTING ENGINEERS

Water Works — Sewerage
Water Purification — Sewage Treatment
Flood Relief — Power Generation
Drainage — Appraisals

20 North Wacker Drive, Chicago

A. J. Boynton & Co.

ENGINEERS

Fixed and Movable Bridges
Structures
Foundations

Design
Construction

100 N. Wabash Ave., Chicago 2.

Consoer, Townsend & Associates

Water Supply, Sewerage, Flood Control & Drainage, Bridges, Express Highways, Paving, Power Plants, Appraisals, Reports, Traffic Studies, Airports, Gas & Electric Transmission Lines.
351 East Ohio St., Chicago 11, Illinois

Ralph H. Burke, Inc.

CONSULTING ENGINEERS

Complete Architectural and Engineering Services
Plans, Supervision, and Reports

Expressways - Grade Separations
Traffic Studies - Parking Structures
Underground Garages- Shore Protection
Parks-Field Houses-Municipal Works
Airports and Air Terminal Buildings

20 North Wacker Drive, Chicago 6, Ill.

Greeley and Hansen

Engineers

Water Supply, Water Purification
Sewerage, Sewage Treatment
Flood Control, Drainage, Refuse Disposal

220 S. State Street, Chicago 4

Consult these Specialists:

Let them save your time by bringing their broad experience in their specialty to bear on your problems.

PROFESSIONAL SERVICES

Cards arranged by areas, states, cities, names

Additional cards on preceding pages

De Leuw, Cather & Company

CONSULTING ENGINEERS

Transportation, Public Transit and Traffic Problems

Industrial Plants — Grade Separations
Railroads — Expressways
Subways — Tunnels
Power Plants — Municipal Works

150 North Wacker Drive
Chicago 6, Ill.

79 McAllister Street
San Francisco 2, Calif.

Harza Engineering Co.

Consulting Engineers

Calvin V. Davis — E. Montford Fuelk
Richard D. Harza

Hydroelectric Plants and Dams
Transmission Lines
Flood Control, Irrigation
River Basin Development

400 West Madison Street — Chicago 6

Kornacker & Assoc., Inc.

Engineers

Bridges, Highways, Expressways and Railways, Building Structures, Industrial Plants, Supervision, Foundations and Soils, Investigations and Reports, Sewerage and Sewage Disposal, Surveys.

53 West Jackson Blvd. — Chicago 4, Ill.

Hazelet & Erdal

CONSULTING ENGINEERS

Fixed Bridges, Movable Bridges, Industrial Plants, Expressways, Airports, Dams

Monadnock Block, Chicago 4, Ill.
Dixie Terminal Bldg., Cincinnati 2, O.
Commerce Bldg., Louisville 2, Ky.

Pioneer Service & Engineering Co.

Consulting and Design Engineers
Operations - - - Purchasing
Steam - - Hydraulic - - Gas
Public Utilities - - Industrials

231 So. La Salle St. — Chicago 4

Sargent & Lundy

ENGINEERS

Steam and Electric Plants
Utilities—Industrials
Studies—Reports—Design
Supervision

Chicago

Chas. W. Cole & Son

Engineers - Architects

Sewerage, Water Supply, Bridges, Highways, Toll Roads, Industrial, Municipal and Commercial Buildings

220 W. LaSalle Ave., Central 4-0127
South Bend, Indiana

Testing Service Corporation

Testing Engineers-Engineering Geologists

Foundation Investigations—Laboratory analyses and Evaluation of Construction Materials—Soil Mechanics, Concrete and Asphalt Technology. Field Inspection and Consultation. Special Investigations for Dams, Turnpikes, Airports.

710 N. Brookfield, South Bend 28, Ind.

The H. C. Nutting Co.

Engineers — *Chemists*

Investigations - Reports
Inspection - Testing
Soils - Foundations - Building Materials
Water — Sewage

4120 Airport Rd. — Cincinnati 26, O.
2145 N. W. 2nd Ave. — Miami 37, Fla.

The Austin Company

Design and Construction

Manufacturing and Process Plants
Airports & Air Transport Buildings
Railroad Terminals and Facilities
Power Plants—Industrial & Institutional
Industrial Office Buildings and Laboratories
Reports and Plant Location Surveys

New York — CLEVELAND — Los Angeles
Chicago — Houston — Oakland
Detroit — Seattle

Havens and Emerson

W. L. Havens — C. A. Emerson
A. A. Burger — F. C. Tolles — F. W. Jones
H. H. Moseley — J. W. Avery
E. S. Ordway — F. S. Palcosay

Consulting Engineers

Water, Sewerage, Garbage, Industrial Wastes, Valuations—Laboratories

Leader Bldg. — Woolworth Bldg.
Cleveland 14 — New York 7

The Osborn Engineering Co.

DESIGNING-CONSULTING

Industrial Plants — Office Buildings
Stadiums — Grand Stands — Field Houses
Bridges — Garages — Laboratories

7016 Euclid Ave. — Cleveland 3, Ohio

Jones, Henry & Williams

Consulting Sanitary Engineers

Water Works, Sewerage & Treatment
Waste Disposal

Security Building — Toledo 4, Ohio

Toledo Testing Laboratory

Engineers—Chemists

Concrete — Soils — Asphalt
Inspection — Research
Tests — Development
Foundation Investigation
Borings — Diamond Drilling — Load Tests
Soils Mechanics Laboratory

1810 North 12th St. — Toledo 2, Ohio

WEST OF MISSISSIPPI

Heron Engineering Co.

Consulting Engineers

For all types of Aerial Tramways, Cableways, and Suspended Structures

2000 South Acoma St.
Denver 19, Colorado

Stanley Engineering Company, *Consulting Engineers*

Airports - Drainage - Electric Power
Flood Control - Industrial - Rate Studies - Sewerage - Valuations - Water Works

Hershey Building — Muscatine, Ia.

Black & Veatch

Consulting Engineers

Water - Sewage - Electricity - Industry Reports, Design, Supervision of Construction, Investigations, Valuation and Rates.

4706 Broadway, Kansas City 3, Mo.

Burns & McDonnell

Consulting and Designing Engineers

P. O. Box 7088, Kansas City 3, Mo.

1404 E. 9th St., Cleveland 14, Ohio

Harrington & Cortelyou

Consulting Engineers

Frank M. Cortelyou
E. M. Newman — F. M. Cortelyou, Jr.

Movable and Fixed Bridges of All Types, Foundations, and Related Structures.

1004 Baltimore — Kansas City 6, Mo.

Russell and Axon

Consulting Engineers

Civil — Sanitary — Structural
Industrial — Electrical
Rate Investigations

408 Olive St. — St. Louis 2, Mo.
Municipal Airport, Daytona Beach, Fla.

Sverdrup & Parcel, Inc.

Consulting Engineers

Bridges, Structures and Reports, Industrial and Power Plant Engineering.

Syndicate Trust Bldg., St. Louis 1, Mo.
220 Bush St., San Francisco 4, Calif.

CHECK this section whenever you need professional advice.

THIS SECTION is available to consulting engineers to contact prospective clients everyweek or every other week.

Benham Engineering Co.

Established in 1909

Design and Construction Engineering Services for Water and Sewage—Highways and Structures—Airports—Power and Heating Plants

215 N E 23rd Street
Oklahoma City 5, Oklahoma

Huston Engineering

Engineers and Consultants

Civil
Electrical

Corpus Christi, Texas — P. O. Box 1437

Lockwood & Andrews

Consulting Engineers

Airports, Paving, Industrial Plants, Drainage & Sewerage, Site Locations, Soils & Foundations, Water Supply, Structures, Harbor Works, Valuations, Reports — Design — Supervision

Union Nat'l Bank Bldg., Houston, Tex.

FAR WEST

International Engineering Company, Inc.

ENGINEERS

Investigations - Reports - Design
Procurement - Field Engineering
Domestic and Foreign

74 New Montgomery St.
San Francisco 5, California.

FOREIGN

The Foundation Engineering Company of Puerto Rico

Consulting Engineers

Foundation and Soil Mechanics Investigations, Laboratory analyses, reports and recommendations, design of structures, Supervision.

P. O. Box 831, San Juan, Puerto Rico

INSPECTION & TEST

Robert W. Hunt Company

Inspection and Testing of Engineering Materials & Equipment

New York • Chicago • San Francisco and other Principal Cities

Johnson Soils Engineering Laboratory

Foundation Design - Highway & Airport Pavements - Construction Control - Load Tests - Shear & Consolidation Tests - MOBILE LABORATORIES

193 West Shore Ave., Bogota, N. J.
Bogota-Hubbard 7-4408

Engineers Testing Laboratory, Inc.

Foundation and Soil Mechanics Investigations

Soil Borings — Laboratory Tests
Foundation Analyses — Reports

3313 Main St. — Houston, Texas

SEARCHLIGHT SECTION

This index is published as a convenience to the reader. Every care is taken to make it accurate but SEARCHLIGHT SECTION assumes no responsibility for errors or omissions.

Albert Pipe Supply Co., Inc. 91
Ambursen Dam Co., Inc. 90
American Air Compressor Corp. 89
Anderson Equipment Co. 90
Arborio, Inc., John 87
Atkinson Co., Guy F. 88, 89
Boers Equipment Co., Gil 91
Branigan & Co., H. J. 91
Brumel, Ralph R. 87
Builders Equipment & Supplies Co. 87
Campanella & Cardi Construction Co. 88
Castadia Inc. 87
Construction Service Co. 91
Contractors Machinery Co. 89, 90
Cooney, G. A. 88
Crane Service Inc. 88
Dallavia Co., Inc. 87
Davidson Pipe Co., Inc. 91
Deatherage & Son, G. E. 86
Diamond Construction Co. 87
Dippel & Co., W. N. 91
Drachman Steel Corp., Hy. 88
Dyer Co., Inc., W. H. 88
Forsythe Equipment Co., Inc. 91
Foster Co., L. B. 90
Frank, M. K. 88
Frantz Equipment Co. 89
Frazier-Davis Construction Corp. 88, 89, 91
Furnival Machinery Co. 90
Gannett Fleming Corddry & Carpenter Inc. 85
Gillis & Co. 88
Globe Pipe & Fitting Co. 91
Greenheart Inc. 90
Judge & Co., Inc., Frank M. 89
Mason & Bacon Co. 90
McCarrick Brothers 88
McEnter, F. D. 85
Merwin and Son, Walter 87
Methods Engineering Council 86
Midwest Steel Corp. 88
Mississippi Valley Equipment Corp. 90
O'Neill, A. J. 88
Perini Quebec Inc. 87
Pesco Equipment Co. 88
Pfotzer Inc., E. & E. J. 88
Sanborn, Steketee & Assoc. 85
Smith Co., Hy. Y. 88
Stanhope Inc., R. C. 91
Stone the Crane Man 91
Tallman, Frank Benson 87, 88
Tamblyn System 86
Uehlein, Frank J. 91
Wagnan Pile Co., Inc. 87
Wenzel Machine Co. 91
Williams Construction Co. 87, 91
Wilson Engineering Co. 86
Wooldridge Manufacturing Co. 86

ADVERTISERS IN THIS ISSUE

Acker Drill Co. 63
Amer. Bitumuls & Asphalt Co. 43
Amer. Cable Div., Amer. Chain & Cable Co. 29
Amer. Mutual Liability Ins. Co. 48, 49
Amer. Steel & Wire Div. U. S. Steel Corp. 70, 71
Arkwright Finishing Co. 56
Armco Drainage & Metal Products, Inc. . 34

Barber-Greene Company..... 66
Bethlehem Steel Co. 1
Borden Metal Products..... 20
Broderick & Bascom Rope Co. .....4th cover
Bruning Co., Inc., Charles..... 33

Cement Gun Company..... 62
Chevrolet Motor Div., General Motors Corp. 14
Clark Equip. Co., Construction Machinery Div. 65
Clayton Mfg. Co. 79
Clyde Iron Works, Inc. 46
Cole Mfg. Co., R. D..... 83
Crucible Steel Co. of America..... 18

Detroit Steel Products Co. 58
Dewey & Almy Chemical Div., W. R. Grace & Co. 32
Dravo Corp. 3

Faber-Castell Pencil Co., A. W. 78
Foote Const. Equip. Div., Blaw-Knox Co. 38
Fredrick Iron & Steel Corp. 81

Goldblatt Tool Co. 79
Goodrich Company, The B. F. 5
Golden Anderson Valve Co. 28
Griffin Wellpoint Corporation..... 66
Gulf Oil Corp. 76
Gunite Concrete & Construction Co..... 83
Gunite Construction Corp. 73

Joy Mfg. Co. 37

Kerrigan Iron Works Inc. 8
Kinnear Mfg. Co. 82

Layne & Bowler Pump Co. 68
LeTourneau-Westinghouse Co. 9-12
Levco Corp. 6
Lewis Asphalt Eng. Corp. 95
Lock Joint Pipe Co. 16
Longyear Co. 95

McKiernan-Terry Corp. 73
Moretrench Corp. 79
Muller Machinery Co..... 81

Naylor Pipe Co..... 51
New England Carbide Tool Co. 55
Newport News Shipbuilding and Dry Dock Co. 44

Oliver Corp. .....2nd cover
Owens Corning Fiberglas Corp. 52

Pioneer Engineering Works.....40, 41
Plasteel Products Corp. 74

Quad City Const. Co. 69

Ramset Fasteners, Inc. 57
Richmont Inc. 54

Sauerman Bros., Inc. 67
Schramm, Inc. 13
Servicised Products Corp. 82
Sika Chemical Corp. 73
Smith Engineering Works..... 7
Sprague & Henwood, Inc. 95
Standard Steel Corp. 61

Thew Shovel Co., The.....3rd cover
Timber Structures, Inc. 72
Twin Disc Clutch Co. 66

Union Metal Mfg. Co. 4
U. S. Steel Corp. 30, 31
Universal Form Clamp Co. 80

Waukesha Motor Co. 60
Wickwire Spencer Steel Div., Colorado Fuel & Iron Corp. 15
Wild Heerbrugg Instruments Inc. 2
Willys Motors Inc. 62, 63
Wood Co., R. D. 75

Yeomans Brothers Co. 50

Professional services.....92, 93, 94

SEARCHLIGHT SECTION

(Classified Advertising)
H. E. Hilty, Mgr.

Employment 85, 86, 87
Educational 86
Notices
Proposal 82, 83, 84, 85
Equipment
(For Rent, Sales, Wanted)....87-91

for a
SECURE barrier against hydrostatic head
call for

Karnak®

WATERPROOFING PRODUCTS

Here's how the Karnak Membrane System is superior to ordinary methods of waterproofing, especially where there is danger of water seepage.

THE Karnak long-fibre-cotton cloth, which has been saturated with specially prepared asphalt, is layered, on the job, with alternate moppings of a highly refined and very ductile asphalt. The open mesh of the fabric allows the coating to penetrate and interlock the layers. This provides a firm mechanical bond that resists abrasions, cracks, settling and maintains water resistance through the life of the structure.

Karnak Fabric is non-sticking, unrolls easily to the very end . . . works faster with no waste. It is packed in sturdy corrugated cartons for protected shipping and storage. Available through waterproofing contractors, or distributors or write us for information. *Made by Lewis Asphalt Engineering Corp., 30 Church St., New York 7, N. Y.*

© LAE Corp.

SEE OUR CATALOG IN SWEET'S FILE

OTHER KARNAK PRODUCTS

Asphalt Roof Coatings and Cements
Asphalt Emulsions
Floor Mastic
Asphalt Paint
Aluminum Roof Coating
Wood Block Mastic
Tile Cement
Joint Filler

DRILLING CONTRACTORS

Diamond and Shot Core Borings
Dry Sample Borings
Grout Holes and Pressure Grouting
Foundation Testing for Bridges, Dams and other Heavy Structures

Manufacturers, also of Diamond Core Drilling Machines and complete accessory equipment, including all types of Diamond Drilling Bits. Ask for Bulletin 320.

SPRAGUE & HENWOOD, Inc.
Dept. E, Scranton 2, Penna.

CORE DRILLING

SERVICE AND SUPPLIES
TEST BORINGS FOR FOUNDATIONS
SOIL SAMPLING
GROUT HOLE DRILLING

A COMPLETE LINE OF DIAMOND CORE DRILLS, OPERATING EQUIPMENT AND DIAMOND BITS. SEND FOR BULLETIN 86 AND CATALOG 200.

E. J. Longyear CO.
MINNEAPOLIS
NEW YORK CITY SALT LAKE CITY

EDITORIALS

A practical highway program

DETAILS of the recommendations of the Clay Committee to President Eisenhower as to how his "Grand Plan" for highway development should be inaugurated were made public last week. The committee's chief recommendation—that federal participation in the President's proposed $54-billion ten-year expansion in highway building be concentrated on the 40,000-mile interstate highway system—comes as no surprise to those who have tried to determine how the federal government could insure the undertaking of such a great program short of footing the entire bill. The only answer appeared to be that it can't. If the states are to share in the cost, that sharing must be on a purely voluntary basis and must follow the pattern prescribed by each state's constitutional requirements, which vary widely. The federal government can offer inducements, but it cannot require any state to appropriate money.

Under these conditions, the Clay Committee concluded that the federal government would be justified in footing practically the entire bill for needed work on the 40,000-mile interstate highway system because that system is vital to the nation's economic development and to its defense. Consequently it proposed to the President that the federal government pay $25 billion of the $27 billion that should be spent on that system to bring it up to adequate standards.

That plan has this great advantage: It will insure much faster modernization of the basic interstate network than would be possible if the states were to be required to provide a larger part of the cost. The work may now be completed in the ten-year period set as an objective by the President.

Also, the state funds that otherwise would have been spent on the interstate system under the regular federal-aid program will be released for work on highways that are not part of the interstate net. This will help the states in providing early correction of the worst deficiencies in their state highway systems.

Nevertheless, if the President's objective of adding $54 billion to the normal spending of $47 billion on the nation's highways over the next ten years is to be met the states still must raise $29 billion in addition to what they must raise as their share of the regular $47 billion program.

That is a big order. How ready are the states to meet such a program?

No single answer can be given to that question, but a survey ENR has just made of legislation expected to be considered by the state legislatures that will be in session this year indicates that many are planning to expand their roadbuilding programs.

Only a few states have special authorities that can issue bonds for such purposes outside the normal state debt. All the others that need more money than can be raised by increases in the state's motor-fuel taxes probably will have to resort to bond issues or to setting up special financing authorities. Generally either action will require a referendum. Also, some states have constitutional provisions against issuing bonds to finance such work as roadbuilding.

The Clay Committee made one proposal that will be a help to states that have built toll roads or can obtain private capital for toll-road construction. Wherever existing toll roads or a proposed toll road can be integrated with the interstate system—thus relieving the federal government of building that much of the system—states are to be given credit for that work. This money may not be used to retire toll-road bonds. It must be spent on new highway construction.

As the toll roads built or having good prospects for being built with private funds all are in the populous states where traffic congestion is most widespread, this money should be very useful in helping to correct bad highway conditions at an early date.

Fear that the committee's recommendations would foster a lot of new toll-road projects appears groundless. New toll-road projects still must be able to show enough potential income to attract private capital.

To sum up, the President's Advisory Committee for National Highway Program has taken a very practical approach to a difficult problem. True, it has not come up with proposals that hold promise of producing the entire $54 billion needed to give substance to the President's "Grand Plan." But if producing that sum is beyond sound federal fiscal policy, then that fact should be made known to Congress and the state legislatures and governors as they take up consideration of highway legislation. In this respect, as in all others, the Clay Committee discharged its responsibility to the President and to the nation in a manner deserving of the highest praise.

Commendable self help

LACKING adequate office space for its headquarters in Washington, the National Society of Professional Engineers has set out to raise $400,000 from its own membership to finance construction of a building designed to meet its needs for many years to come. The plan is to raise most or all of the needed money through the sale of Building-Fund Participation Certificates bearing 4% interest. If the money can be so raised, a new headquarters for the society can be provided with minimum trouble and at minimum cost.

It is a novel way for a society to go about financing a needed facility. If only 4,000 of the 33,000 members of NSPE subscribe for one $100 certificate, the needed money will be in hand. And each member who subscribes will have a personal interest in the new building that should enhance his interest in the NSPE.

Get These DRAGLINE FEATURES... To Get Bigger DRAGLINE PROFITS!

Lorain knows from long experience just how to build a real dirt-moving, profit-making dragline. In every model, you get features in a Lorain that insure fast, low-cost, long-life dragline performance.

You get snappy, abundant power for fast acceleration, shorter swing cycle time. Smooth-acting clutches, air operated on many models, respond quickly to the operators' commands. Swing Clutches particularly are extra-heavy duty to take the constant, high-speed, "wig-wag" swinging hour-after-hour, day-after-day, that produces more yardage. Extra-long Lorain crawlers are ideal for dragline duty, improve flotation, eliminate nosing-in, keep you "on top" even when the going's soft. Big diameter, centralized hoist sheaves at the Boom Head add to the hoist cable life, keep the load on center line of the boom. The well-known "Cable Miser" fairlead features big cable-saving sheaves instead of cable-flattening rollers; swivels freely to maintain a constant, direct cable lead to the bucket. Again, cable life is prolonged.

You'll find many more features like these in Lorain draglines . . . each of them is specifically Lorain-engineered for dragline application . . . all of them will help you make more money. Be sure to get a complete dragline story from your nearby Thew-Lorain Distributor before you buy!

THE THEW SHOVEL CO., LORAIN, OHIO

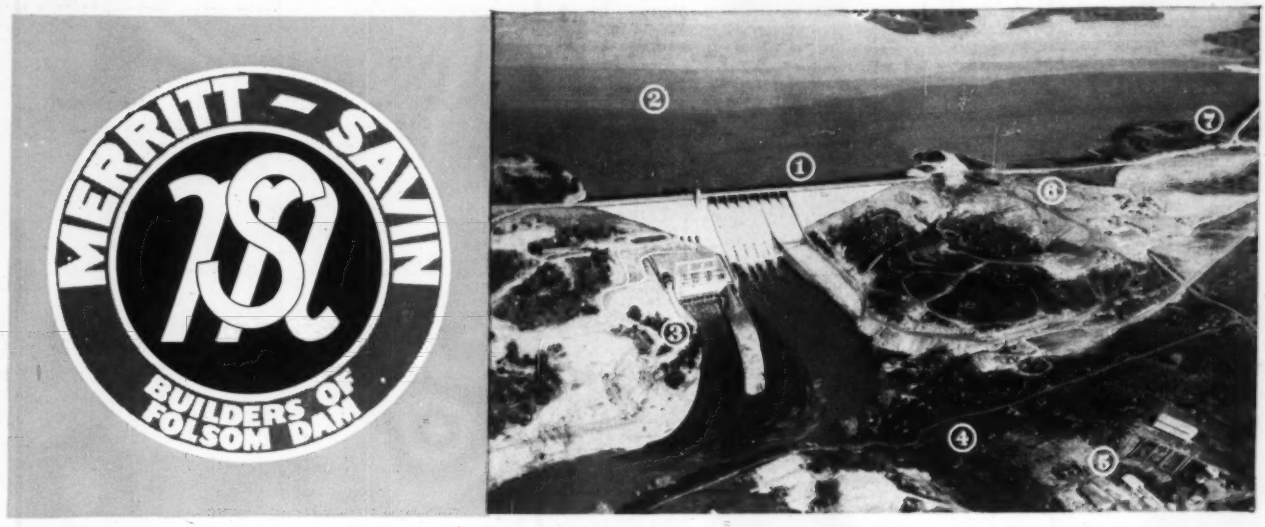
THEW LORAIN®

OFFERING MORE THAN 136 SHOVEL-CRANE COMBINATIONS ON CRAWLERS OR RUBBER TIRES . . . TO BEST FIT YOUR JOB FOR PROFIT!

WANT DRAGLINE *MOBILITY?*

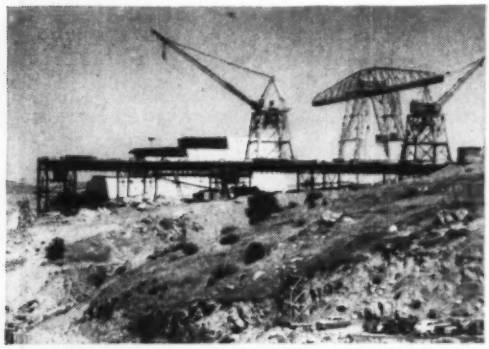
MAKE IT A MOTO-DRAG!

If your work calls for many moves — over the job or from job to job — then you may want the up to 45 m.p.h. mobility of a Lorain Moto-Drag. You get all of the above Lorain turntable features mounted on the best-known and most widely used of all rubber-tire carriers, designed exclusively, not just modified, for such service. In the Lorain line, you get far more dragline selection, on rubber tires or crawlers.

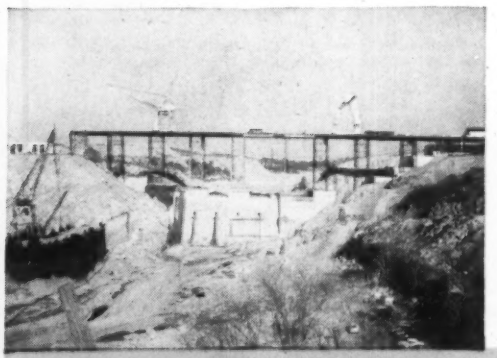


SPECIFY *Yellow Strand*®...

Above: An artist's conception of Folsom Dam. (1) The concrete main structure. (2) Million-acre feet reservoir. (3) Power house and tail race. (4-5) Folsom prison. (6) Auxiliary rock fill. (7) Earth fill.



As equipment removes 40-60 feet of sand and gravel to get to bed rock, the main trestle is readied for the push across the canyon.



Five months later, the dam rises on canyon floor. Gantries and trestle speed handling of concrete. Abnormal floods caused a delay in the work.

WITH 25,000 cu. yds. of concrete going into the main structure each week, Folsom Dam is speeding toward completion. In spite of floods and other natural delays, contractors Merritt-Chapman & Scott and Savin Corporation have kept work on schedule.

The huge dam, built to provide flood control, irrigation and power on the American River near Sacramento, is a $29.4 million project of the Corps of Engineers. The structure will contain 1,200,000 cu. yds. of concrete and will stretch out for a quarter of a mile with flanks protected by another 1¾ miles of rock and earth fill. More than 9,000,000 cu. yds. of earth and rock will have been excavated and 800,000 cu. yds. of selected fill will have been put into place when the dam is completed.

Work started in 1951 and contract completion date is in 1956. To date, well over half the project is finished and present work is moving at a fast clip under direction of D. E. "Dave" Stinson, Project Manager, and L. G. Sumner, Project Engineer.

And to keep machines working under this stepped-up program of production, Yellow Strand Wire Rope is specified by the contractors.

Yellow Strand Wire Rope is made of steel drawn to precise specifications to give it strength for a longer, trouble-free work life. It's flexible to take the blows of impact and the wear of fast-running sheaves. Contractors know from experience that Yellow Strand on their machines is one way of assuring against downtime due to wire rope fatigue. They know that ropes they need will be in stock at nearby Broderick & Bascom distributors.

TRY YELLOW STRAND WIRE ROPE . . .
YOU'LL SPECIFY IT FOR ALL YOUR CONTRACTS!

BRODERICK & BASCOM ROPE CO.
4203 UNION BLVD. • ST. LOUIS 15, MO.